

DECmateTM II

CP/M[®] 2.2, V2.0
User's Guide

digital

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User's Guide

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- Automatic execution of a CP/M command at system cold start. The SETSTART utility allows you to change the CP/M command contained in STARTUP, a utility program which automatically executes the CP/M command it contains whenever the DECmate II system is cold started.

Compatibility of CP/M 2.2, Version 2.0 With Version 1.0

CP/M 2.2, Version 2.0 system diskettes for diskette-only systems support all of the functions of Version 1.0 system diskettes. You do not need to alter any programs that you developed or used with Version 1.0 of CP/M.

There is slightly less available file space on Version 2.0 system diskettes for diskette-only systems than on Version 1.0 system diskettes (356K instead of 362K). The CP/M system image file has increased in size from 24K to 30K. Version 2.0 data diskettes are identical to Version 1.0 data diskettes.

A DECmate II diskette-only system using a Version 2.0 system diskette has the same amount of available memory for user programs as a system using a Version 1.0 system diskette (57,088 bytes). A DECmate II system equipped with a hard disk subsystem has 56,064 bytes of available memory for user programs.

Intended Reader

This manual is intended for first-time users running CP/M on a DECmate II system. You do not need to know how to program to use this manual. Your DECmate II system can run the CP/M operating system when the optional CP/M board is installed. (CP/M is a registered trademark of Digital Research Inc.) *If you are the first user of a newly-installed system, refer to the DECmate II Getting Started Card for your system before reading this manual (Order numbers: for diskette system, AV-P498B-TV; for hard disk system, AV-W534A-TV).*

DECmate II users who want to run application programs under CP/M should refer to Chapter 2. This chapter explains the basics of using CP/M. It provides practice examples and instructions in using some of the most frequently used CP/M commands.

DECmate II users whose systems include a hard disk should pay special attention to the sections of this manual which describe the use of the RD51 hard disk subsystem with CP/M. DECmate II users whose systems do not include a hard disk should skip over these sections.

Manual Structure

Chapter 1 tells you how to install and start CP/M on both diskette and hard disk DECmate II systems, and how to update Version 1.0 system diskettes. It also explains how to use the SET-UP key to change DECmate II system operating features, and how to use the SET-UP key to initiate the process for changing back and forth between operating from system diskettes and hard disk volumes. It also explains how the DECmate II keyboard works under CP/M.

Chapter 2 tells you how to use CP/M commands to manipulate your files and perform basic maintenance tasks (such as storing information on diskettes and erasing files). It also explains the CP/M error messages and conditions and what to do about them. Use the exercises provided throughout this chapter to practice using the CP/M operating system.

Chapter 3 describes the basic CP/M command set and the error messages unique to each command. This chapter is a reference section for the basic CP/M command set.

Chapter 4 describes the CP/M commands associated with assembly language programming. This chapter is an introduction to these advanced CP/M commands.

Chapter 5 describes the CP/M utility programs that operate on all DECmate II systems and the error messages unique to each utility. This chapter is a reference section to the CP/M utility program set.

Chapter 6 describes the CP/M utility programs for the optional RD51 hard disk subsystem and the error messages unique to each utility. This chapter is a reference section to the CP/M hard disk utility program set.

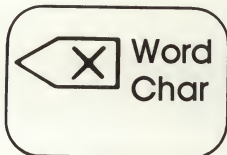
Chapter 7 discusses trouble you might have with your DECmate II system or CP/M. It tells you how to isolate the trouble, and what to do about it.

Appendix A tells you how to handle, use, and store your diskettes. It also contains information on how to order diskettes from DIGITAL.

Conventions Used in This Manual

The following conventions are used throughout the manual:

- In examples of dialog between you and the computer, what the computer displays is printed in black. What you type is printed in blue.
- Text printed in dot matrix type is information that is displayed on the screen.
- <RET> means press the RETURN key on your keyboard.
- Press <RET> after you enter a command or after you enter a response to a CP/M command.
- <CTRL/X> means hold down the CTRL key and press some other key (in this case, the letter X).
- In CP/M utility programs which use both the <RET> and DO keys, press <RET> to terminate input to the utility, and press the DO key to execute a function.



The term "Rubout key" refers to the WORD/CHAR key on the main keyboard. Pressing the WORD/CHAR key once rubs out the character to the left of the cursor.

- CP/M refers to the DECmate II RX50 diskette drives as A, B, C, and D (rather than 0, 1, 2, and 3). If you add either RX01 or RX02 disk drives or a RD51 hard disk subsystem to your DECmate II, CP/M refers to these drives as E, F, G, and H.

Information Sources for Advanced CP/M Users

The *CP/M User's Guide* (Order number: AA-N191B-TV) is primarily written for beginning users who want to run CP/M applications programs on DECmate II. Such programs (available from DIGITAL and other software vendors) cover a wide range of tasks—from number manipulation through business planning and word processing. This manual concentrates on those aspects of DECmate II systems and CP/M useful for running these applications programs and handling data files. It discusses in detail the CP/M commands that facilitate file creation and maintenance. This manual also discusses those commands that enable you to initialize and copy diskettes, as well as commands that direct input and output to external devices.

The CP/M software for assembling and debugging programs is briefly discussed in Chapter 4 of this manual. Readers who want more information about assembly language programming on the DECmate II system should order the complete set of Digital Research CP/M manuals. These manuals contain detailed information on the CP/M assembler, debugger, and related programs. You can order these manuals at the following address:

Digital Research
P O Box 579
Pacific Grove, Ca
93950

Advanced CP/M users may also find the following books useful:

Thom Hogan, *Osborne CP/M User Guide*, Osborne/McGraw Hill, Berkeley, California, 1981

Rodnay Zaks, *The CP/M Handbook with MP/M*, Sybex Inc., 1980

Introduction to CP/M

CP/M (the Control Program for Microprocessors) is an *operating system*, or a program, through which you can control the files and application programs running on your DECmate II system.

This chapter provides instructions in the following:

- How to install CP/M on your DECmate II system; that is, how to create CP/M system diskettes and volumes
- How to update CP/M 2.2, V1.0 system diskettes
- How to start and end daily work sessions
- How to view the system diskette or volume directory
- How the DECmate II keyboard works under the control of CP/M
- How to use the SET-UP key to change your system operating mode, and system diskettes and volumes

NOTE: *If you are the first user of a newly-installed system, refer to the DECmate II CP/M Getting Started Card for your system before using this guide. (Order numbers: for diskette system, AV-P498B-TV; for hard disk system, AV-W534A-TV.)*

Installing and Starting CP/M on a Diskette System

In order to start up a DECmate II diskette system, you must have a CP/M system diskette. Create this system diskette by performing the installation procedure outlined below. To do this, use the CP/M installation diskette (labeled CP/M 2.2, V2.0 INSTL BIN RX50) and two blank diskettes. You will find these diskettes in your CP/M software distribution kit.

NOTE: *After you complete the initial installation procedure, insert the CP/M installation diskette into its protective envelope and store it in a safe place. Then use the backup copy of the CP/M installation diskette to create any additional CP/M system diskettes that you require for your DECmate II system.*

To install CP/M on your DECmate II system, first display the Installation menu on the screen.

Displaying the Installation Menu

To display the Installation menu on the screen, follow these steps:

- 1 Open the diskette drive doors and make sure that all drives are empty, as shown in Figure 1.

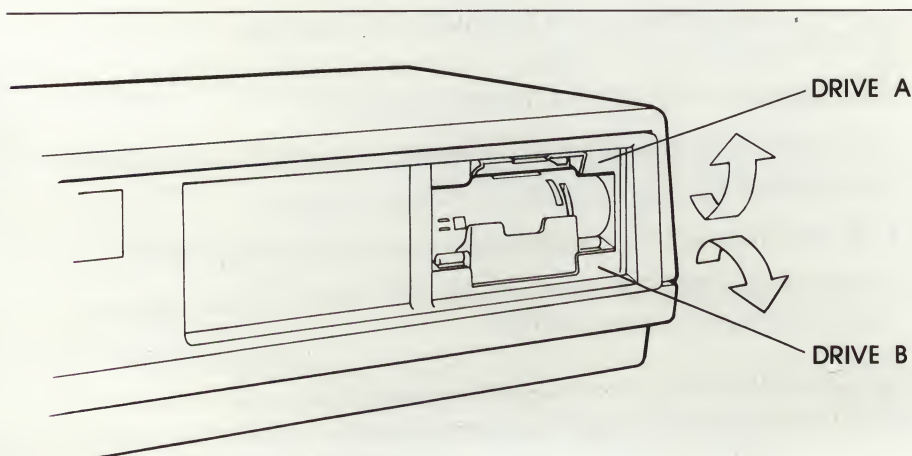


Figure 1 Open Drive Doors

CAUTION: *Never turn the system power on or off while diskettes are in the drives and the drive doors are closed. This may erase information on the diskettes.*

- 2 Turn on all equipment connected to the system unit (for example, a printer or RX01/RX02 disk drives).
- 3 Press the system unit power switch to the on (1) position (see Figure 2). If the power switch is already on, turn it off, wait four seconds, then turn it on again.

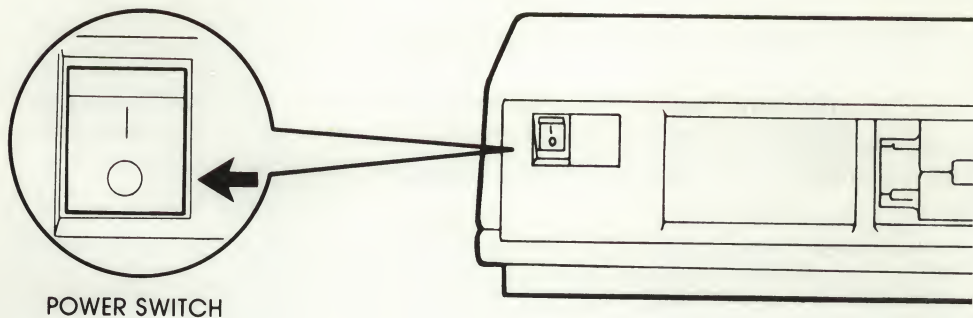


Figure 2 Press System Unit Power Switch On

This starts the automatic self-test. After about 20 to 30 seconds, the screen displays the DECmate II logo. If the screen remains blank or displays a number, refer to the section Problems with Startup later in this chapter.

- 4 Insert the CP/M installation diskette into drive A and close the drive door (see Figure 3). *Make sure the arrow on the diskette lines up with the colored bar on drive A.*

NOTE: *CP/M refers to the DECmate II RX50 drives as A, B, C, and D. If you add RX01 or RX02 drives (using an RX01/RX02 adapter) CP/M refers to them as drives E, F, G, and H.*

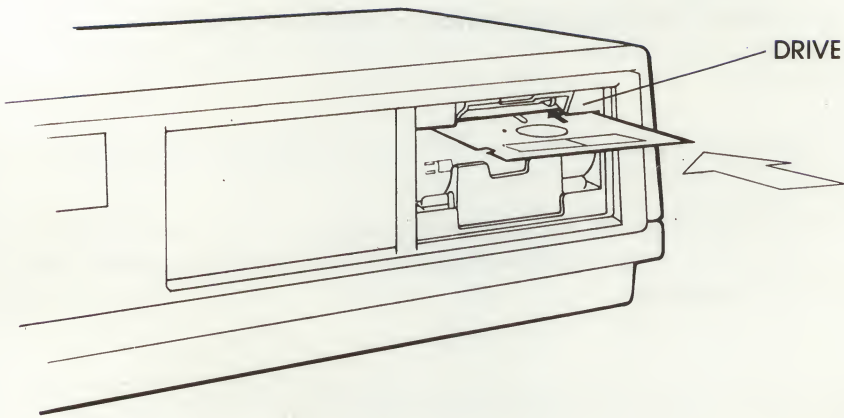
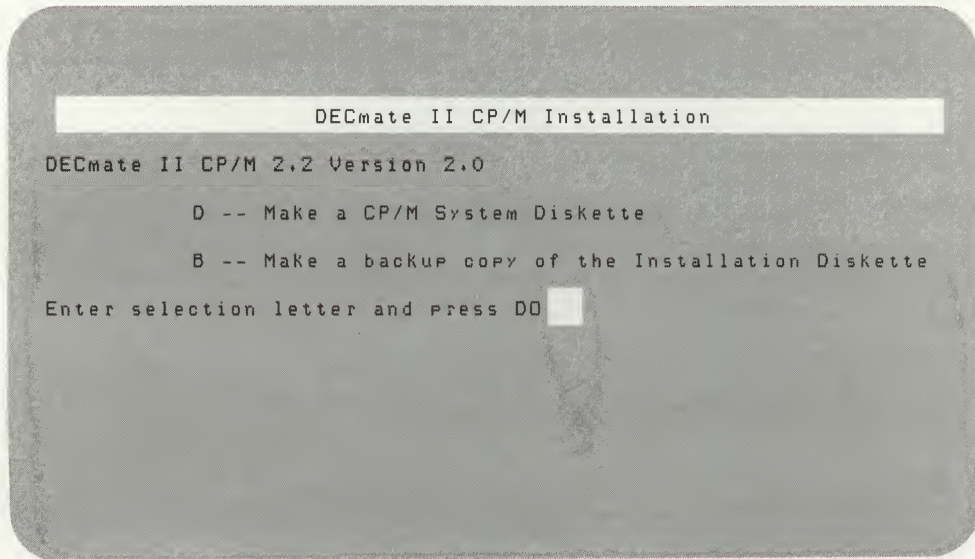


Figure 3 Insert System Diskette into Drive A

After a few seconds, the system displays the message, CP/M loading..., followed by the letters ABCDEFG, the CP/M version number and copyright notice, and finally the Installation menu, as shown in Screen 1.



Screen 1

The Installation menu presents you with two choices. You can:

- Select D and make a CP/M system diskette.
- Select B and make a backup copy of the CP/M installation diskette.

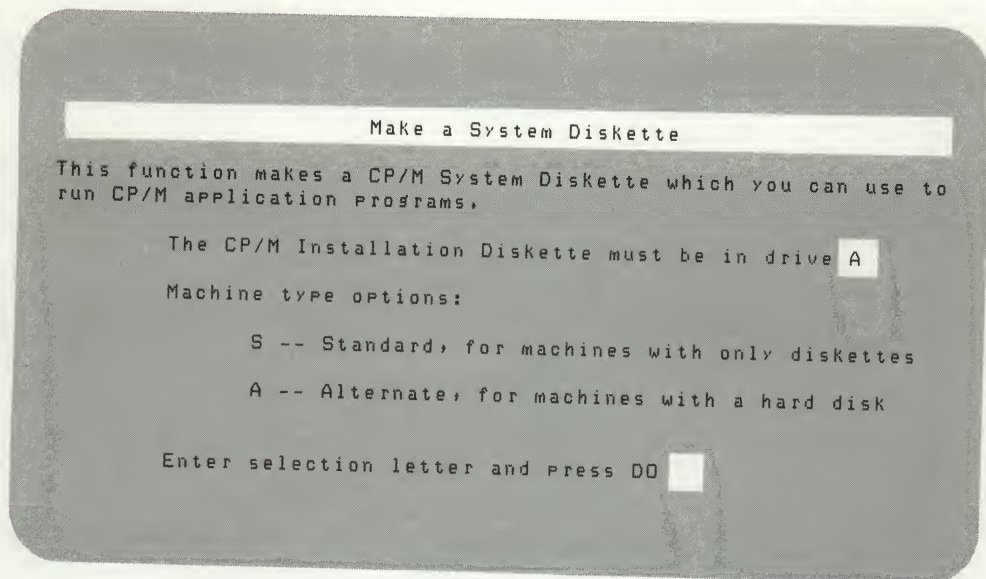
Creating CP/M System Diskettes

Use this option to create a CP/M system diskette.

Make sure a copy of the CP/M installation diskette is in drive A and the CP/M Installation menu is on the screen. If the Installation menu (see Screen 1) is not on the screen, follow the procedure in the section Displaying the Installation Menu earlier in this chapter.

Have a blank diskette ready and perform the following steps:

- 1 Type **D** and press the **DO** key.
- 2 The system displays the Machine Type Options menu and some instructions, as shown in Screen 2.



Screen 2

The Machine Type Options menu gives you two choices. You can:

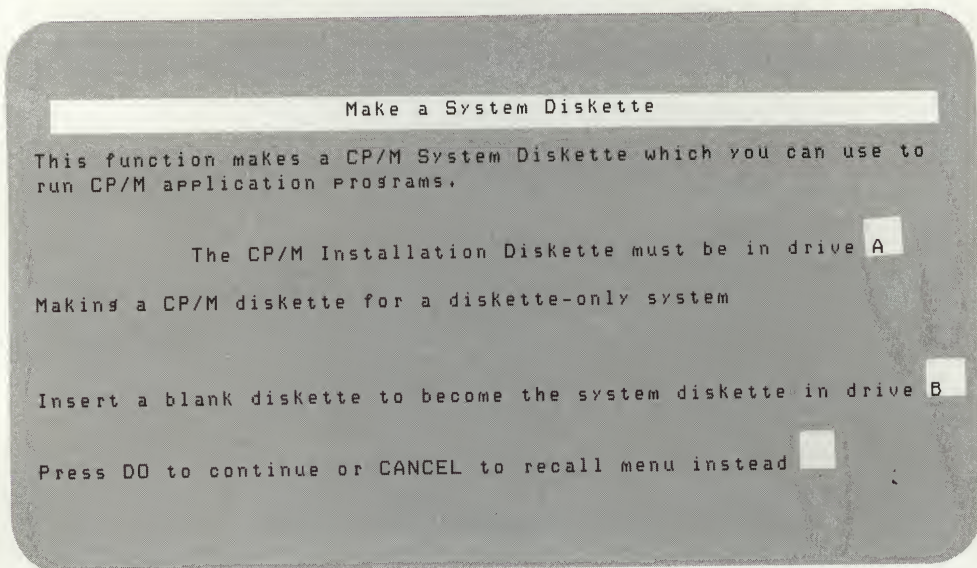
- Select S and create a standard type CP/M system diskette. This diskette is tailored to DECmate II systems with diskette drives only.
- Select A and create an alternate type CP/M system diskette. This diskette is tailored to DECmate II systems which include the optional RD51 hard disk drive.

Creating Standard Type CP/M System Diskettes. Use this option to create a standard type CP/M system diskette. This diskette supports RX50 diskettes on drives A, B, C, and D and RX01/RX02 diskettes on drives E, F, G, and H.

Make sure a copy of your CP/M installation diskette is in drive A and the Machine Type Options menu is displayed on the screen. If the Machine Type Options menu (see Screen 2) is not on the screen, follow the procedure in the section Creating CP/M System Diskettes earlier in this chapter.

Have a blank diskette ready and perform the following steps:

- 1 Type **S** and press the **DO** key. The system displays instructions for creating a CP/M system diskette for a diskette-only system, as shown in Screen 3.



Screen 3

- 2 Insert a blank diskette into drive B (see Figure 4). Then close the door to drive B and press the **Do** key.

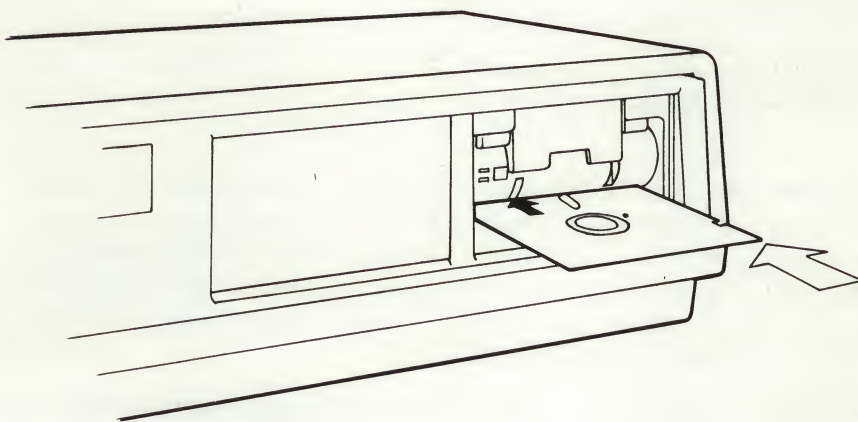


Figure 4 Insert Diskette into Drive B

The DECmate II system displays a series of messages as CP/M is copied from the installation diskette onto the system diskette. Each message names a component of the CP/M operating system as it is copied from one diskette to the other.

- 3 When the copying process ends, the following message appears:

System diskette complete. Remove the diskette from drive B and label it as:

```

-----
|DECmate II CP/M 2.2 Version 2.0 |
|      SYSTEM DISKETTE          |
|      for diskettes only       |
|      SERIAL# 637-XXXXXX      |
-----
  
```

Press MAIN SCREEN to recall the menu

Follow the instructions on the screen. Remove the diskette from drive B and label it. Use a felt-tip pen to label the CP/M system diskette with the label information exactly as you see it on the screen.

This new diskette is your copy of the standard type CP/M system diskette. This diskette is sometimes referred to as a *working copy* of the CP/M system diskette.

- 4 Press **F9**, the MAIN SCREEN key, to display the Installation menu.
- 5 You can now use your new system diskette to start CP/M on a DECmate II diskette system.

Creating Alternate Type CP/M System Diskettes. Use this option to create an alternate type CP/M system diskette. This system diskette supports RX50 diskettes on drives A, B, C, and D, and RD51 hard disk volumes on drives E, F, G, and H. In order to use the hard disk features provided on this diskette, you must use the diskette with a DECmate II system that has an RD51 hard disk subsystem installed and properly formatted.

When you use an alternate type CP/M system diskette, you load the CP/M operating system from drive A. You may access hard disk volumes as data volumes but you may not boot hard disk system volumes.

Make sure a copy of your CP/M installation diskette is in drive A and the Machine Type Options menu is displayed on the screen. If the Machine Type Options menu (see Screen 2) is not on the screen, follow the procedure in the section Creating CP/M System Diskettes earlier in this chapter.

Have a blank diskette ready and perform the following steps:

- 1 Type **A** and press the **DO** key. The system displays instructions for making a CP/M system diskette for a hard disk system as shown in Screen 4.

Make a System Diskette

This function makes a CP/M System Diskette which you can use to run CP/M applications Programs.

The CP/M Installation Diskette must be in drive **A**

Making a CP/M diskette for a hard disk system

Insert a blank diskette to become the system diskette in drive **B**

Press **DO** to continue or **CANCEL** to recall menu instead

Screen 4

- 2 Insert a blank diskette into drive B, close the drive B door, and press the **Do** key.

The DECmate II system displays a series of messages as CP/M is copied from the installation diskette onto the system diskette. Each message names a component of the CP/M operating system as it is copied from one diskette to the other.

- 3 When the copying process ends, the following message appears:

System diskette complete. Remove the diskette from drive B and label it as:

```

-----
|DECmate II CP/M 2.2 Version 2.0 |
|      SYSTEM DISKETTE          |
|  for diskettes and hard disk  |
|      SERIAL# 367-XXXXXX      |
-----

```

Press **MAIN SCREEN** to recall the menu

Follow the instructions on the screen. Remove the diskette from drive B and label it. Use a felt-tip pen to label the CP/M system diskette with the label information exactly as you see it on the screen.

This new diskette is your copy of the alternate type of CP/M system diskette. This diskette is sometimes referred to as a working copy of the CP/M system diskette.

- 4 Press **F9**, the MAIN SCREEN key, to display the Installation menu.
- 5 You can now use your new alternate type CP/M system diskette to start CP/M on a DECmate II system which is equipped with an RD51 hard disk subsystem.

Backing Up the Installation Diskette

Use this option to make a backup copy of the CP/M installation diskette.

Make sure your installation diskette is in drive A and the CP/M Installation menu is displayed on the screen. If the Installation menu (see Screen 1) is not on the screen, follow the procedure in the section Displaying the Installation Menu earlier in this chapter.

Have a blank diskette ready and perform the following steps:

- 1 Type **B** and press the **DO** key.
- 2 Follow the instructions on Screen 5.

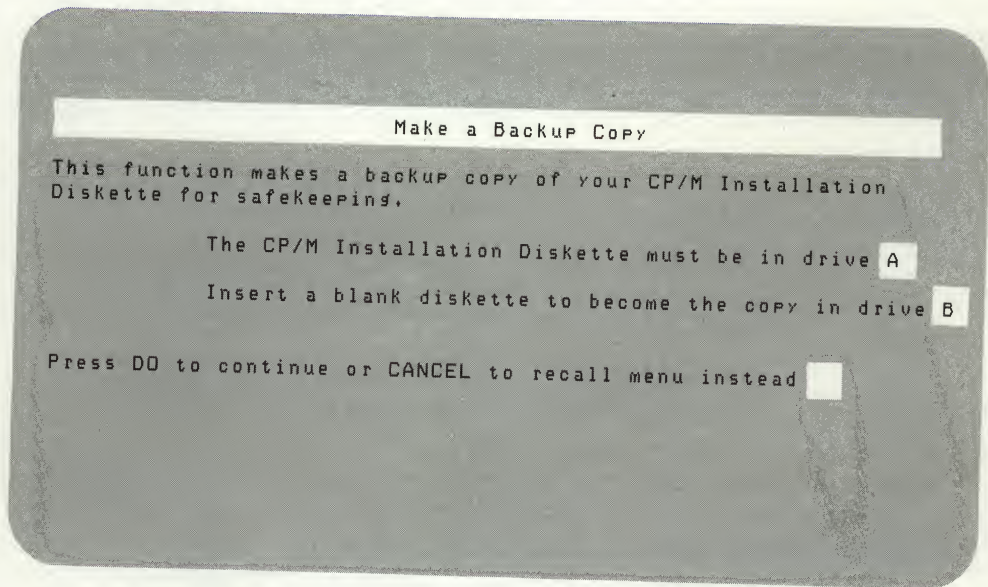
Make sure the CP/M installation diskette is in drive A and insert the blank diskette into drive B. Then close the door to drive B and press the **DO** key.

- 3 As the system copies the CP/M installation diskette in drive A onto the blank diskette in drive B, it displays the message:

`copying:`

This message is followed by a row of 80 dots.

As the copying process proceeds, one by one the dots change to asterisks.



Screen 5

- 4 When the copying process ends, the row of asterisks changes to the following message:

Backup copy complete. Remove the diskette from drive B
and label it as:

```

-----
!DECmate II CP/M 2.2 Version 2.0  !
!          INSTALLATION DISKETTE  !
!Backup copy   Serial# 367-xxxxxx !
-----

```

Press MAIN SCREEN to recall the menu

- Follow the instructions on the screen. Remove the diskette from drive B and label it. Use a felt-tip pen to label the diskette. Copy the label information exactly as you see it on the screen. This diskette is your backup copy of the CP/M installation diskette.
- 5 Insert the backup copy of the installation diskette into its protective envelope and store it in a safe place. Use this backup copy of the installation diskette to create future CP/M system diskettes for your DECmate II system.
- 6 Press **F9**, the MAIN SCREEN key, to display the Installation menu.

Errors During Installation

If an error occurs while you are installing CP/M, one of these messages appears on the screen.

```
DRIVE B NOT READY - press Ctrl-C OR insert diskette, close door -  
press RETURN
```

This message indicates that you either did not insert a blank diskette into drive B or you did not close the door to drive B.

To correct the problem, insert a blank diskette into drive B, if there is no diskette in the drive, close the drive door, and press **<RET>**.

To cancel the copying operation and continue without correcting the problem, press **<CTRL/C>**. Then press **F9**, the MAIN SCREEN key, to return to the Installation menu.

```
WRITE-PROTECTED disk in drive B, press Ctrl-C OR remove tab and  
press RETURN
```

This message indicates that the diskette you inserted into drive B is a write-protected diskette.

To correct the problem, remove the diskette from drive B and, if you want to write on the diskette, peel off the write-protect tab and reinsert the diskette into drive B. Close the door to drive B and press **<RET>**. Or, if you do not want to write on the diskette, press **<CTRL/C>**.

To cancel the copying operation and continue without correcting the problem, press **<CTRL/C>**. Then press **F9**, the MAIN SCREEN key, to return to the Installation menu.

Starting CP/M When Your Diskette System is On

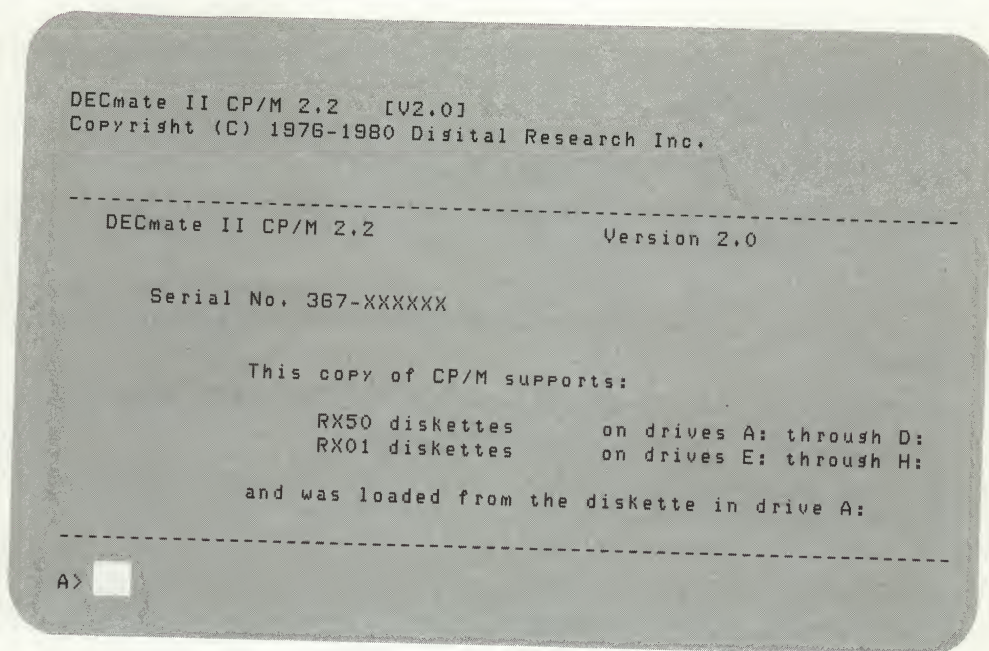
Follow these instructions if your DECmate II system is on and you want to start CP/M without first turning the system off.

You can also use this procedure to change from one DECmate II operating system to another; for example, you were using WPS and you wanted to operate your DECmate II system with CP/M.

Perform the following steps:

- 1 Press the **SET-UP** key. The User Selection menu appears on the screen.
- 2 Press the **REMOVE** key.
- 3 Open the drive A door, remove the diskette, if any, and store it in its protective envelope.
- 4 Insert the CP/M system diskette into drive A, close the drive door, and press the **DO** key.
- 5 The message, CP/M loading..., appears, followed by the CP/M startup messages, the startup banner, and A> prompt.

If you started a standard type CP/M system diskette, your display screen looks like Screen 6.



Screen 6

NOTE: *If you have used the SETSTART command to create a different STARTUP program, you may see a different display than the CP/M startup banner shown in Screen 6.*

When the A> prompt appears on the screen, you can enter any of the CP/M commands described in the *DECmate II CP/M User's Guide*. Or, you can install a software product, such as MBASIC or Multiplan. Specific instructions are included in the Getting Started Card for each software product.

If you do not see the CP/M startup messages and A> prompt on the display screen, refer to the section, Problems with Startup, later in this chapter.

Starting CP/M When Your Diskette System is Off

Follow these instructions if your DECmate II system is off and you want to start CP/M.

Perform the following steps:

- 1 Open the drive doors and remove any diskettes.
- 2 Turn on any equipment connected to the system unit (for example, a printer or RX01/RX02 disk drives).
- 3 Press the system unit power switch to the on (1) position. If the power switch is already on, turn it off, wait four seconds, and then turn it on again.
- 4 Insert your CP/M system diskette into drive A. Make sure the arrow on the diskette lines up with the bar on drive A.
- 5 Close the door to drive A. After a few seconds, the system displays the message, CP/M loading..., followed by the CP/M startup messages, the CP/M startup banner, and A> prompt.

If you started a standard type of CP/M system diskette, your display screen looks like Screen 6, above.

NOTE: *If you have used the SETSTART command to create a different STARTUP program, you may see a different display than the CP/M startup banner shown in Screen 6.*

When the A> prompt appears on the screen, you can enter any of the CP/M commands described in the *DECmate II CP/M User's Guide*. Or, you can install a software product, such as MBASIC or Multiplan. Specific instructions are included in the Getting Started Card for each software product.

If you do not see the CP/M startup messages and A> prompt on the display screen, refer to the section Problems with Startup later in this chapter.

Problems with Startup

If you have started your DECmate II system, and you do not see the CP/M prompt:

- Check the screen brightness and contrast control knobs on the rear of the video monitor and adjust them if necessary.
- Check the lights on the keyboard. If the HOLD SCREEN light (top row of keyboard) is on, press the HOLD SCREEN key to turn it off.
- Check the cables that connect your DECmate II system unit to the keyboard and display screen. Make sure that they are securely fastened at both ends.
- Remove the CP/M system diskette from drive A, turn off the system, and repeat the startup procedure.

If you see a number on the screen, this means that your DECmate II system detected a problem during the startup procedure. Refer to the *DECmate II Owner's Manual* (Order number: EK-DECM2-OM-001) for information on how to correct the problem.

If the problem persists, refer to Chapter 6, What to Do in Case of Trouble.

Stopping a DECmate II Diskette System

When you are finished using your DECmate II system for the day:

- 1 Back up (or copy) any diskette that you have changed (added or deleted information). Use the DISKCOPY utility program described in Chapter 5. Then store the original diskette in a safe place in case the copy is accidentally destroyed or lost.

This is extremely important. If you are not in the habit of backing up your diskettes, you risk losing data files or even the contents of an entire diskette if an error occurs.

For information on how to handle and care for your diskettes, refer to Appendix A, Storing, Handling, and Using Diskettes.

- 2 Remove all diskettes from the drives and store them in their protective envelopes.
- 3 Press the system unit power switch to the off (0) position.
- 4 Turn off any equipment connected to the system unit.

NOTE: *Never turn the system power on or off while diskettes are in the drives and the drive doors are closed. This may erase information on the diskettes.*

Installing and Starting CP/M on a Hard Disk System

NOTE: *If you are a first-time user of a newly-installed system, refer to the DECmate II CP/M Getting Started Card for your system before using this guide. (Order numbers: for diskette system, AV-P498B-TV; for hard disk, AV-W534A-TV.)*

In order to start up a DECmate II hard disk system, you must create either a CP/M hard disk system volume or an alternate type CP/M system diskette (a CP/M system diskette which will allow you to access hard disk volumes as data volumes).

Your hard disk subsystem must be formatted before you can install CP/M or any other operating system. See the *RD51 Hard Disk Installation Guide* (order number: EK-DM2HD-IN-001) for more information.

Instructions for installing CP/M, that is, creating a CP/M system volume or an alternate type CP/M system diskette, follow. To do this, use the CP/M installation diskette (labeled CP/M 2.2, V2.0 INSTL BIN RX50) and one blank diskette. (You need a second blank diskette if you are creating an alternate type CP/M system diskette.) You will find these diskettes in your CP/M software distribution kit.

NOTE: *After you complete the initial installation procedure, insert the CP/M installation diskette into its protective envelope and store it in a safe place. Then use the backup copy of the CP/M installation diskette to create any additional CP/M system volumes or diskettes that you require for your DECmate II system.*

To install CP/M on your DECmate II hard disk system, first display the Installation menu on the screen.

Displaying the Installation Menu

To display the Installation menu on your screen, follow these steps:

- 1 Open the diskette drive doors and make sure that all drives are empty, as shown in Figure 5.

CAUTION: *Never turn the system power on or off while diskettes are in the drives and the drive doors are closed. This may erase information on the diskettes.*

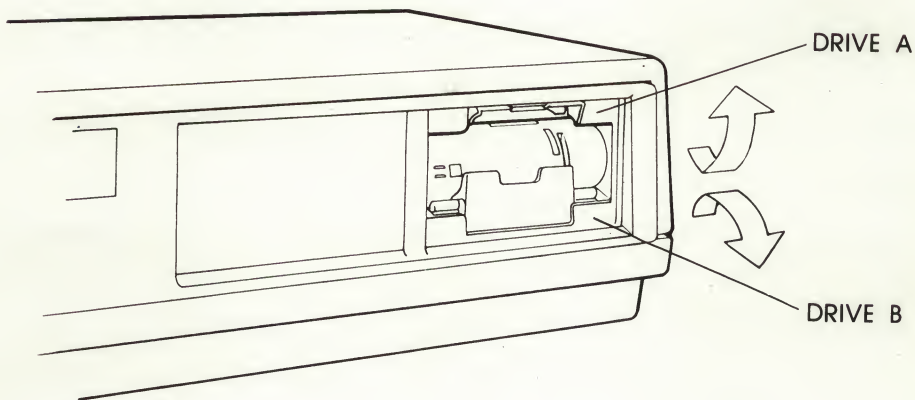


Figure 5 Open Drive Doors

- 2 Turn on any equipment connected to the system unit (for example, a printer).
- 3 Insert the CP/M installation diskette into drive A but *do not close the drive door* (see Figure 6). Make sure the arrow on the diskette lines up with the colored bar on drive A.

NOTE: *CP/M refers to the DECmate II RX50 drives as A, B, C, and D and the RD51 hard disk drives as E, F, G, and H.*

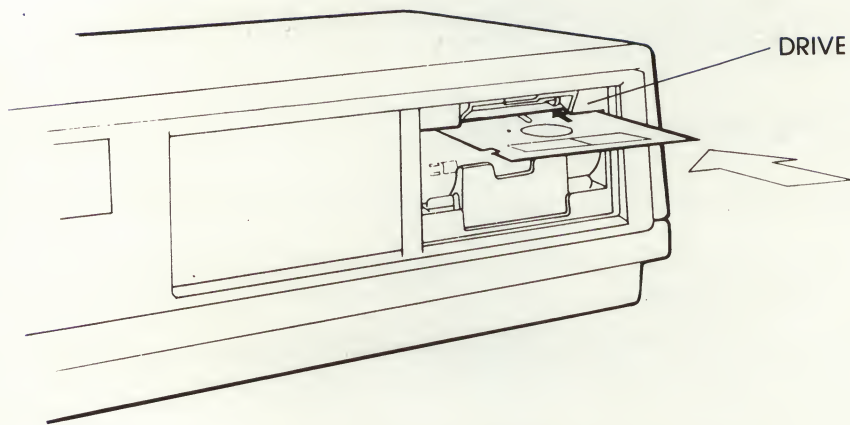


Figure 6 Insert System Diskette Into Drive A

- 4 Press the system unit power switch to the on (1) position (see Figure 7). If the power switch is already on, turn it off, wait four seconds, and then turn it on again.

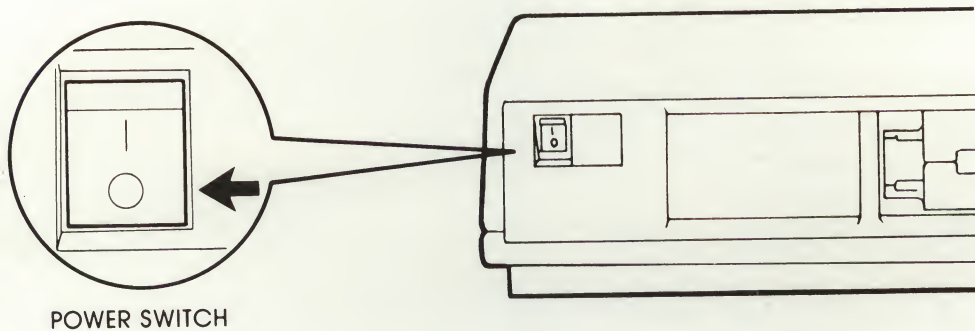
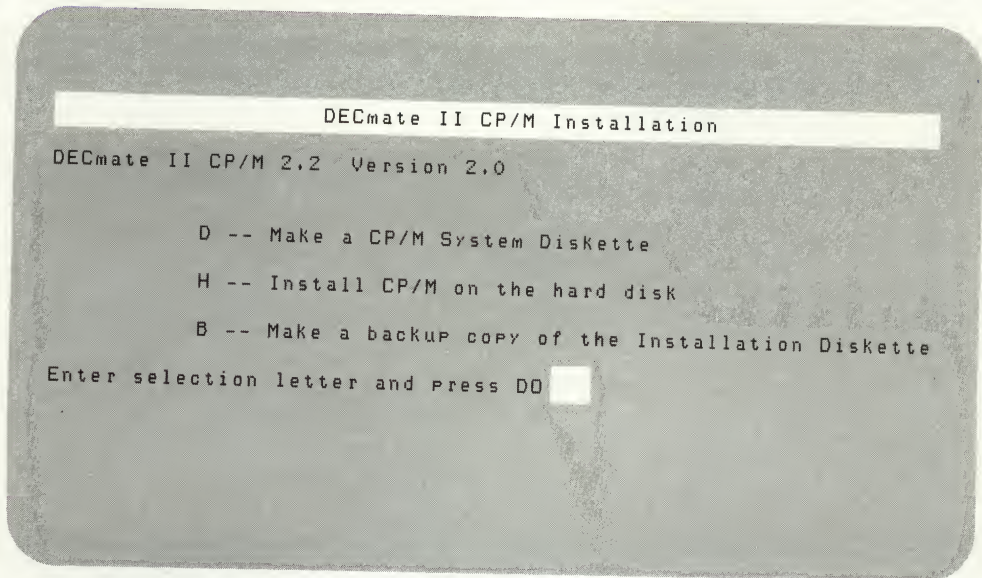


Figure 7 Press System Unit Power Switch On

- 5 *Immediately* close the door to drive A. After a few seconds, the DECmate II logo flashes on the screen. The system then displays the message, CP/M loading..., followed by the letters ABCDEFG, the CP/M version number and copyright notice, and finally the Installation menu as shown in Screen 7. If the screen remains blank or displays a number, refer to the section Problems with Startup later in this chapter.



Screen 7

The Installation menu gives you three choices. You can:

- Select D and make a CP/M system diskette.
- Select H and install CP/M on the hard disk.
- Select B and make a backup copy of the CP/M installation diskette.

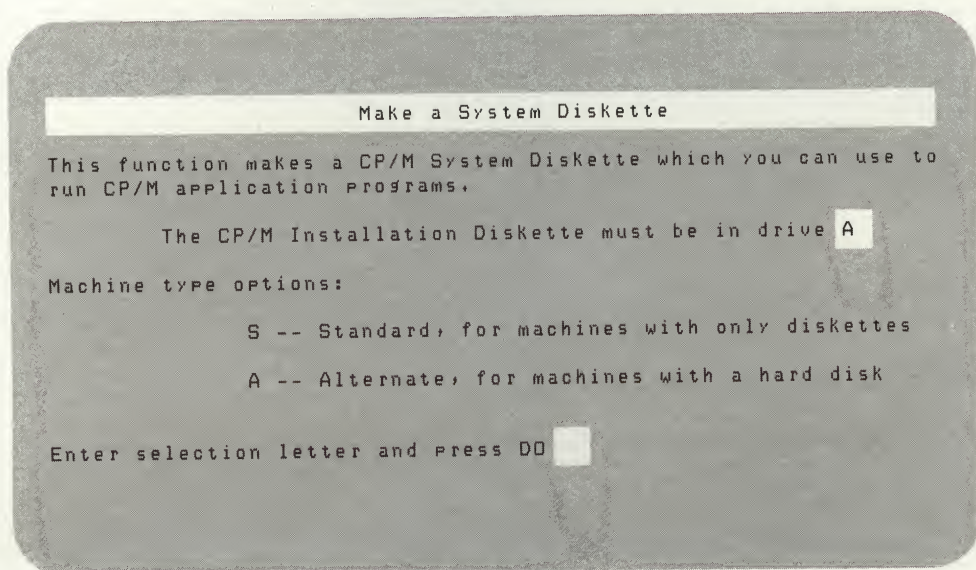
Creating CP/M System Diskettes

Use this option to create a CP/M system diskette.

Make sure a copy of your CP/M installation diskette is in drive A and the CP/M Installation menu is displayed on the screen. If the Installation menu (see Screen 7) is not on the screen, follow the procedure in the section Displaying the Installation Menu earlier in this chapter.

Have a blank diskette ready and perform the following steps:

- 1 Type **D** and press the **DO** key.
- 2 The system displays the Machine Type Options menu and some instructions, as shown in Screen 8.



Screen 8

The Machine Type Options menu gives you two choices. You can:

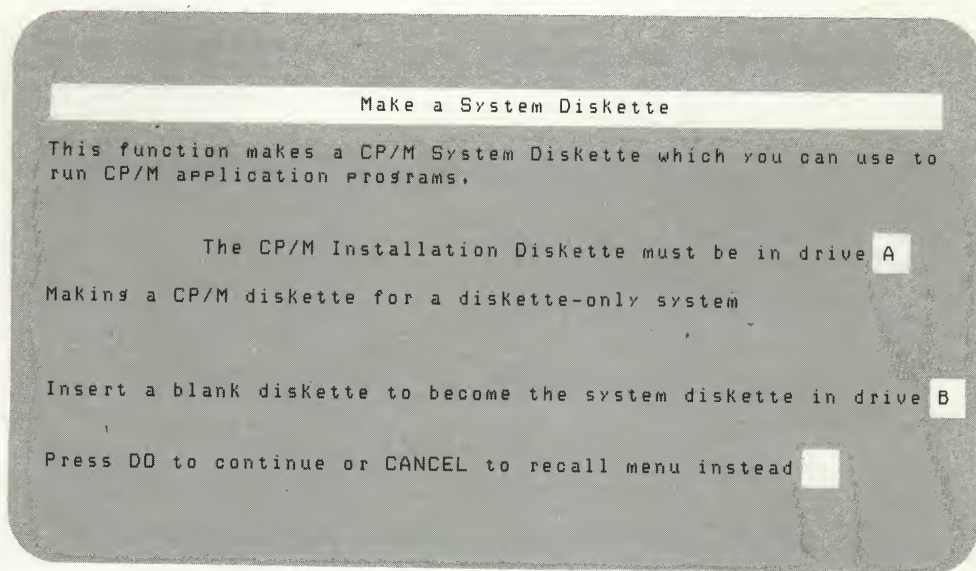
- Select S and create a standard type CP/M system diskette. This diskette is tailored to DECmate II systems with diskette drives only.
- Select A and create an alternate type CP/M system diskette. This diskette is tailored to DECmate II systems which include the optional RD51 hard disk drive.

Creating Standard Type CP/M System Diskettes. Use this option to create a standard type CP/M system diskette. This diskette supports RX50 diskettes on drives A, B, C, and D and RX01/RX02 diskettes on drives E, F, G, and H.

Make sure a copy of your CP/M installation diskette is in drive A and the Machine Type Options menu is displayed on the screen. If the Machine Type Options menu (see Screen 8) is not on the screen, follow the procedure in the section Creating CP/M System Diskettes earlier in this chapter.

Have a blank diskette ready and perform the following steps:

- 1 Type **S** and press the **DO** key. The system displays instructions for creating a CP/M system diskette for a diskette-only system, as shown in Screen 9.



Screen 9

- 2 Insert a blank diskette into drive B (see Figure 8). Then close the door to drive B, and press the **Do** key.
-

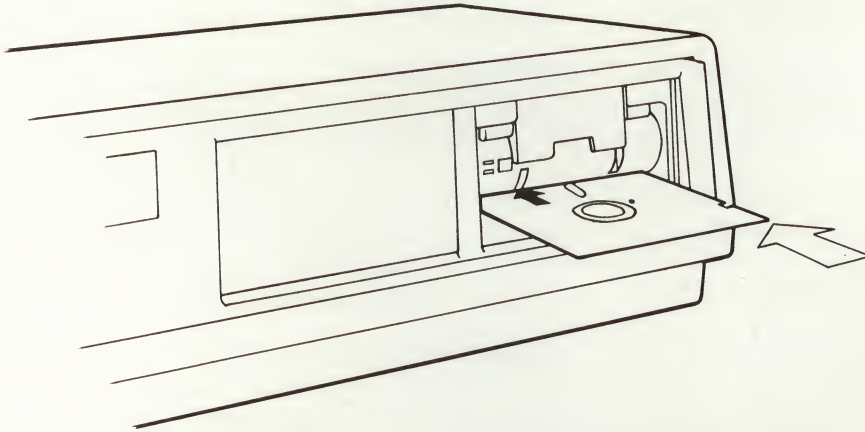


Figure 8 Insert Diskette into Drive B

The DECmate II system displays a series of messages as CP/M is copied from the installation diskette onto the system diskette. Each message names a component of the CP/M operating system as it is copied from one diskette to the other.

- 3 When the copying process ends, the following message appears:

```
System diskette complete. Remove the diskette from drive
B and label it as:
```

```
-----
|DECmate II CP/M 2.2 Version 2.0 |
|      SYSTEM DISKETTE          |
|    for diskette only systems  |
|      SERIAL# 367-XXXXXX      |
|                               |
|-----|
```

```
Press MAIN SCREEN to recall the menu
```

Follow the instructions on the screen. Remove the diskette from drive B and label it. Use a felt-tip pen to label the CP/M system diskette with the label information exactly as you see it on the screen.

This new diskette is your copy of the standard CP/M system diskette. This diskette is sometimes referred to as a *working copy* of the CP/M system diskette.

- 4 Press **F9**, the MAIN SCREEN key, to display the Installation menu.
- 5 You can now use your new system diskette to start CP/M on a DECmate II diskette system.

Creating Alternate Type CP/M System Diskettes. Use this option to create an alternate type CP/M system diskette. This system diskette supports RX50 diskettes on drives A, B, C, and D and RD51 hard disk volumes on drives E, F, G, and H. In order to use the hard disk features provided on this diskette, you must use the diskette with a DECmate II system that has an RD51 hard disk subsystem installed and properly formatted.

When you use an alternate type CP/M system diskette, you load the CP/M operating system from drive A. You may access hard disk volumes as data volumes but you may not boot hard disk system volumes.

Make sure a copy of your CP/M installation diskette is in drive A and the Machine Type Options menu is displayed on the screen. If the Machine Type Options menu (see Screen 5) is not on the screen, follow the procedure in the section Creating CP/M System Diskettes earlier in this chapter.

Have a blank diskette ready and perform the following steps:

- 1 Type **A** and press the **DO** key. The system displays instructions for making CP/M system diskettes for hard disk systems, as shown in Screen 10.
- 2 Insert a blank diskette into drive B, close the door to drive B, and press the **Do** key.

The DECmate II system displays a series of messages as CP/M is copied from the installation diskette onto the system diskette. Each message names a component of the CP/M operating system as it is copied from one diskette to the other.

Make a System Diskette

This function makes a CP/M System Diskette which you can use to run CP/M applications Programs.

The CP/M Installation Diskette must be in drive **A**

Making a CP/M diskette for a hard disk system

Insert a blank diskette to become the system diskette in drive **B**

Press **DO** to continue or **CANCEL** to recall menu instead

Screen 10

- 3 When the copying process ends, the following message appears:

System diskette complete. Remove the diskette from drive
B and label it as:

```
-----  
|DECmate II CP/M 2.2 Version 2.0 |  
|          SYSTEM DISKETTE      |  
|      for diskettes and hard disk |  
|          SERIAL# 367-XXXXXX    |  
-----
```

Press **MAIN SCREEN** to recall the menu

Follow the instructions on the screen. Remove the diskette from drive B and label it. Use a felt-tip pen to label the CP/M system diskette with the label information exactly as you see it on the screen.

This new diskette is your copy of the alternate type of CP/M system diskette. This diskette is sometimes referred to as a *working copy* of the CP/M system diskette.

- 4 Press **F9**, the **MAIN SCREEN** key, to recall the Installation menu.

- 5 You can now use your new alternate type CP/M system diskette to start CP/M on a DECMate II system which is equipped with an RD51 hard disk system.

Creating CP/M System Volumes

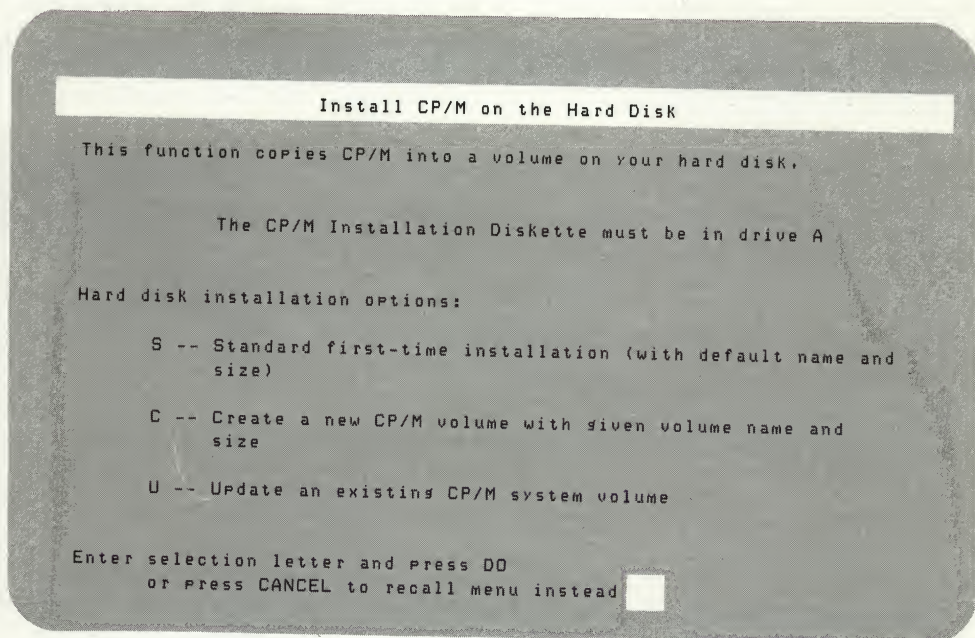
Use this option to create a CP/M system volume on a hard disk.

Make sure a copy of your CP/M installation diskette is in drive A, and the CP/M Installation menu is displayed on the screen. If the Installation menu (see Screen 7) is not on the screen, follow the steps in the section Displaying the Installation Menu earlier in this chapter.

Perform the following steps:

- 1 Type **H** and press the **DO** key.

The system displays the Hard Disk Installation Options menu and some instructions, as shown in Screen 11.



Screen 11

The Hard Disk Installation Options menu gives you the three choices. You can:

- Select S and create a CP/M startup volume on a newly-formatted hard disk.
- Select C and create a CP/M system volume on a hard disk which may already contain at least one other CP/M system volume.
- Select U and update the component parts of CP/M in an existing CP/M system volume. This option changes only the CP/M operating system. It does not alter anything else on the volume. For example, data files and programs do not change.

Creating a CP/M System Volume on a New Hard Disk. Use this option to create a CP/M system volume on a newly-installed and formatted hard disk subsystem or on a hard disk subsystem which does not contain a CP/M system volume. This is the easiest way to install CP/M on a new hard disk; the volume name and size are automatically supplied. If there is no startup volume on the hard disk when you use this option, the volume created will be a startup volume; that is, the volume will automatically boot when you start the system.

Make sure a copy of your CP/M installation diskette is in drive A and the Hard Disk Installation Options menu is displayed on the screen. If the Hard Disk Installation Options menu (see Screen 11) is not on the screen, follow the procedure in the section Creating CP/M System Volumes earlier in this chapter.

Perform the following steps:

- 1 Type **S** and press the **DO** key. The system displays instructions for creating a CP/M system volume, as shown in Screen 12.

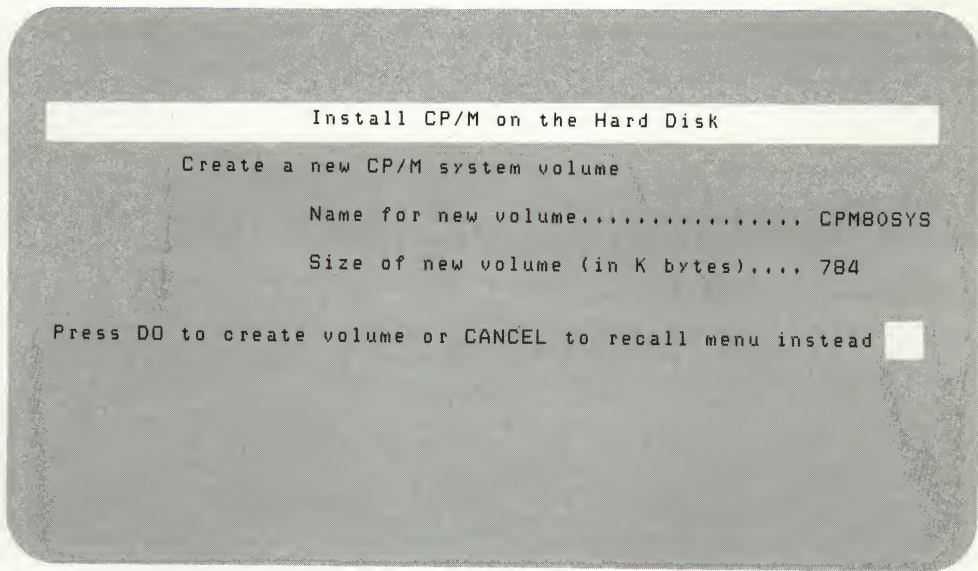
The volume name, CPM80SYS, and the volume size, 784K, are supplied by the Installation program.

- 2 Press the **DO** key to create the CP/M system volume.

If you do not have a startup volume on your hard disk, the system displays a new message:

```
The new volume will be your STARTUP volume
```

The DECmate II system then displays a series of messages as CP/M is copied from the installation diskette to the hard disk system volume. Each message names a component of the CP/M operating system as it is copied from the CP/M installation diskette to the new CP/M system volume.



Screen 12

- 3 When the copying process ends, the following message appears:

CP/M Installed in hard disk volume CPMBOSYS

Press MAIN SCREEN to recall the menu

Press **F9**, the MAIN SCREEN key, to display the Installation menu.

You can now run CP/M from your new CP/M system volume.

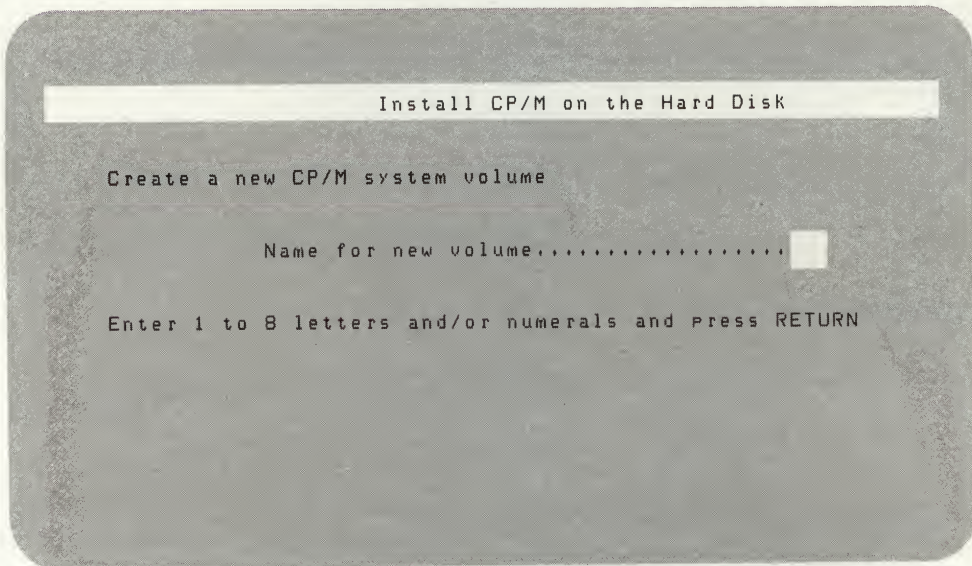
Creating Additional CP/M System Volumes. Use this option to create a CP/M system volume when you want to supply the volume name and size. This option is useful if you want to create a system volume for an applications program.

You will need to supply a unique name and a size (in K bytes) for the new system volume. If a startup volume already exists on the hard disk, this volume will not be marked as a startup volume.

Make sure a copy of your CP/M installation diskette is in drive A and the Hard Disk Installation Options menu is displayed on the screen. If the Hard Disk Installation Options menu (see Screen 11) is not on the screen, follow the procedure in the section Creating CP/M System Volumes earlier in this chapter.

Perform the following steps:

- 1 Type **C** and press the **DO** key. The system displays instructions for creating a CP/M system volume, as shown in Screen 13.



Screen 13

- 2 Enter a one- to eight-character name for the new system volume and press **<RET>**. Legal characters for volume names include only the letters A to Z and the numerals 0 to 9. The new volume name must be a name that is not currently used on the hard disk.

The system then asks:

Size of new volume (in K bytes)

Enter a number between 200 and XXXX.
(It will be rounded up to a multiple of 8.)

- 3 Enter a number between 200 K bytes and XXXX K bytes, where XXXX is the largest free area on the hard disk or 8224, whichever is less. Then press <RET>. The number you supply will be rounded up to a multiple of 8.

Press the DO key. The DECmate II system then displays a series of messages as CP/M is copied from the installation diskette to the hard disk system volume. Each message names a component of the CP/M operating system as it is copied from the CP/M installation diskette to the new CP/M system volume.

- 4 When the copying process ends, the following message appears:

```
CP/M installed in hard disk volume XXXXXXXX
```

```
Press MAIN SCREEN to recall the menu
```

where XXXXXXXX is the name you gave the CP/M system volume.

Press F9, the MAIN SCREEN key, to return to the Installation menu.

You can now run CP/M from your new CP/M system volume.

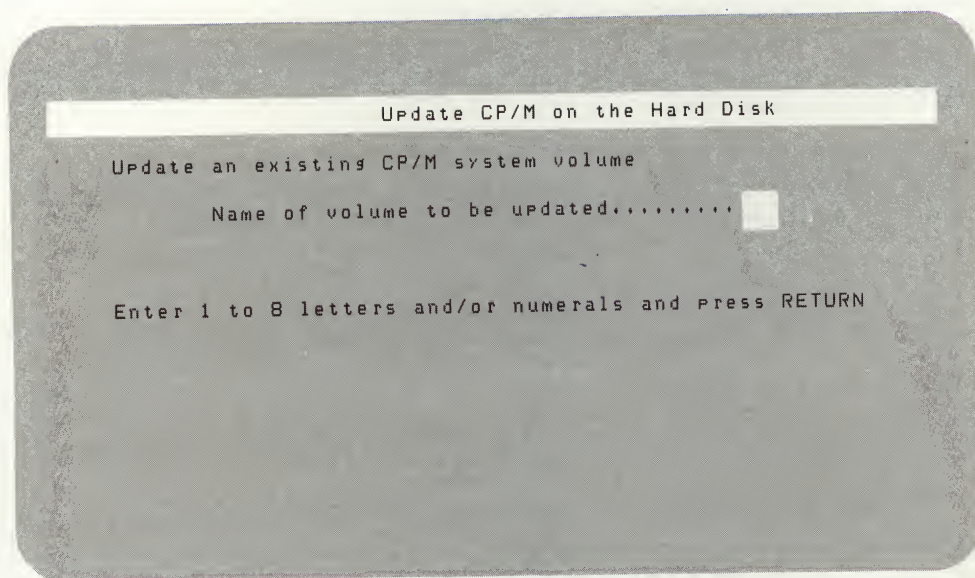
Updating Existing CP/M System Volumes. Use this option to revise the CP/M operating system on an existing CP/M system volume without erasing any other files or programs on the volume.

Update replaces each component part of the the CP/M operating system currently on the system volume with a new one from the CP/M installation diskette.

Make sure a copy of your CP/M installation diskette is in drive A and the Hard Disk Installation Options menu is displayed on the screen. If the Hard Disk Installation Options menu (see Screen 11) is not on the screen, follow the procedure in the section Creating CP/M System Volumes earlier in this chapter.

Perform the following steps:

- 1 Type U and press the DO key. The system displays instructions for updating a CP/M system volume, as shown in Screen 14.



Screen 14

- 2 Enter the name of the volume you want to update and press **<RET>**
The volume name must be the name of an existing *system* volume on the hard disk. You cannot use the Update option to change a CP/M data volume to a system volume.
- 3 Press the **DO** key to update the hard disk volume.
You see a series of copying messages as the component parts of the CP/M operating system are updated.
- 4 When the system completes the update process, the following message appears:

CP/M updated in hard disk volume XXXXXXXX

Press MAIN SCREEN to recall the menu

where XXXXXXXX is the name of the CP/M system volume you updated.

Press **F9**, the MAIN SCREEN key, to return to the Installation menu.

You can now run CP/M from the updated CP/M system volume on your hard disk system.

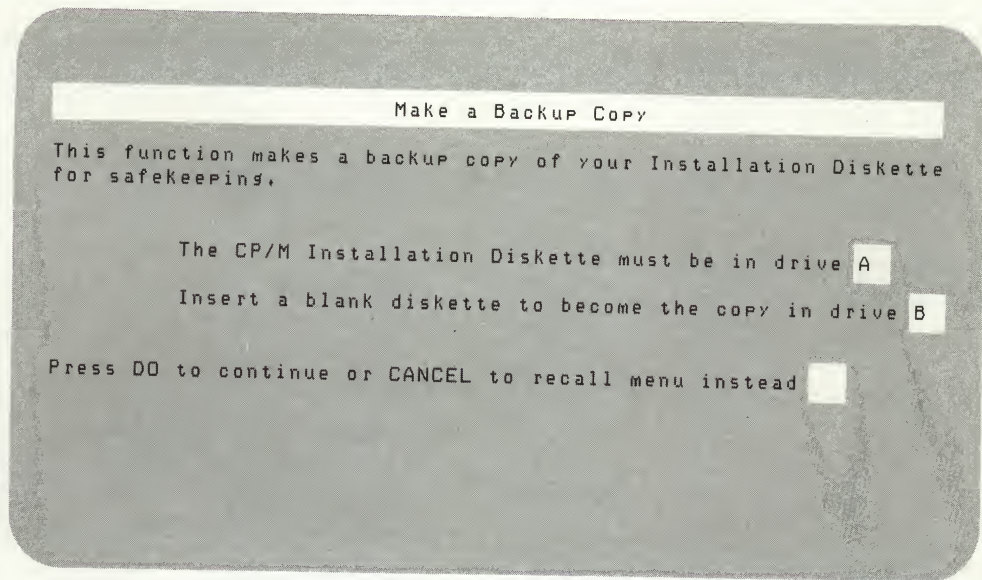
Backing Up the Installation Diskette

Use this option to make a backup copy of the CP/M installation diskette.

Make sure your CP/M installation diskette is in drive A and the CP/M Installation menu is displayed on the screen. If the Installation menu (see Screen 7) is not on the screen, follow the procedure in the section Displaying the Installation Menu earlier in this chapter.

Have a blank diskette ready and perform the following steps:

- 1 Type **B** and press the **DO** key.
- 2 Follow the instructions on the screen, as shown on Screen 15.



Screen 15

Make sure the CP/M installation diskette is in drive A and insert the blank diskette into drive B. Then close the door to drive B and press the **DO** key.

- 3 As the system copies the CP/M installation diskette in drive A onto the blank diskette in drive B, it displays the message:

`COPYING:`

This message is followed by a row of 80 dots.

As the copying process proceeds, one by one the dots change to asterisks.

- 4 When the copying process ends, the row of asterisks changes to the following message:

`Backup copy complete. Remove the diskette from drive B
and label it as:`

```
-----  
| DECmate II CP/M 2.2 Version 2.0 |  
|           INSTALLATION DISKETTE |  
| Backup copy   Serial# 367-xxxxxx |  
-----
```

`Press MAIN SCREEN to recall the menu`

Follow the instructions on the screen. Remove the diskette from drive B and label it. Use a felt-tip pen to label the diskette. Copy the label information exactly as you see it on the screen. This diskette is your backup copy of the CP/M installation diskette.

- 5 Insert the backup copy of the installation diskette into its protective envelope and store it in a safe place. Use this backup copy of the installation diskette to generate future CP/M system diskettes for your DECmate II system.
- 6 Press **F9**, the MAIN SCREEN key, to display the Installation menu.

Errors During Installation

If an error occurs while you are installing CP/M, one of the following messages appears on the screen.

`DRIVE B NOT READY - Press Ctrl-C OR insert diskette, close door -
Press RETURN`

This message indicates that you either did not insert a blank diskette into drive B or you did not close the door to drive B.

To correct the problem, insert a blank diskette into drive B, if there is no diskette in drive B, close the drive door, and press <RET>.

To cancel the copying operation and continue without correcting the problem, press <CTRL/C>. Then press F9, the MAIN SCREEN key, to return to the Installation menu.

```
Error while writing to System Disk
Error code = 2
```

```
Unable to complete CP/M on hard disk
```

```
Press MAIN SCREEN to recall the menu
```

This message indicates that you attempted to update a system volume and ran out of disk space during the update process.

If you delete infrequently used CP/M command files from the system volume to make room for more data files or a large applications program, you can overfill your volume during the update process. This results in the error condition shown above and leaves you with an incomplete volume.

To correct the problem, first, make a note of the CP/M file that was being copied when the error occurred. Then press F9, the MAIN SCREEN key, to return to the Installation menu. Start CP/M and (following the instructions in the following text) complete the update process manually.

The CP/M files are updated in alphabetical order as listed below:

```
ASM.COM
BOOT.COM
DDT.COM
DISKCOPY.COM
DISKINIT.COM
DISMOUNT.COM
DUMP.ASM
DUMP.COM
ED.COM
GREETING.COM
HD.COM
```


LOAD.COM
MOUNT.COM
PIP.COM
PRSETUP.COM
SETSTART.COM
STARTUP.COM
STAT.COM
SUBMIT.COM
WPSCONV.COM
XSUB.COM

The file that was being copied when the error occurred is incomplete. The files beyond it were not copied at all. If you want to include any of these files on your system volume, you must make room for them by deleting files. Use the following procedure:

- 1 Use the DIR command (discussed in Chapter 3) to display a list of the files that were copied onto the partially updated volume.
- 2 Use the ERA command (also discussed in Chapter 3) to erase the files you do not want to include in your system volume.
- 3 Use the PIP command (also discussed in Chapter 3) to copy the files you want to include from the installation diskette onto your system volume.

Name already used on disk

Press RETURN to try again or CANCEL to recall the menu instead

This message indicates that the volume name you entered currently names a volume on the hard disk.

To correct the problem, press <RET> and enter another name.

To stop the operation and return to the Installation menu, press F8, the CANCEL key.

Named volume not found on disk

Press RETURN to try again or CANCEL to recall the menu instead

This message indicates that the name you entered is not the name of a volume on the hard disk.

To correct the problem, press **<RET>** and enter another volume name.

To stop the operation and return to the Installation menu, press **F8**, the CANCEL key.

Volume is not a CP/M system volume

Press RETURN to try again or CANCEL to recall the menu instead

This message indicates that the volume you selected is not a CP/M system volume.

To correct the problem, press **<RET>** and enter the name of a CP/M system volume.

To stop the operation and return to the Installation menu, press **F8**, the CANCEL key.

WRITE-PROTECTED disk in drive B, press Ctrl-C OR remove tab and press RETURN

This message indicates that the diskette you inserted into drive B is a write-protected diskette.

To correct the problem, remove the diskette from drive B and, if you want to write on the diskette, peel off the write-protect tab and reinsert the diskette into drive B. Close the door to drive B and press **<RET>**. Or, if you do not want to write on the diskette, press **<CTRL/C>**.

To cancel the copying operation and continue without correcting the problem, press **<CTRL/C>**. Then press **F9**, the MAIN SCREEN key, to return to the Installation menu.

Starting CP/M When Your Hard Disk System is On

Use one of these procedures if you have installed CP/M on your DECmate II hard disk system by creating a CP/M system volume or an alternate type CP/M system diskette, your system is on, and you want to start up your system.

You can also use one of these procedures when you want to change from one DECmate II operating system to another. Refer to the appropriate section in the following text for instructions.

Starting CP/M From the Startup Volume. Use this procedure when your DECmate II system is on and you want to start CP/M from the startup volume on the hard disk. For example, you would use this procedure if you had installed CP/M in the system startup volume, were operating your DECmate II system with an alternate type CP/M system diskette, and you wanted to run CP/M from a system volume.

Perform the following steps:

- 1 Press the **SET-UP** key. The User Selection menu appears on the screen.
- 2 Press the **REMOVE** key.
- 3 Open the drive doors, if they are closed, and remove the diskettes, if any. Store the diskettes in their protective envelopes.
- 4 Do not close the drive doors. Press the **DO** key.

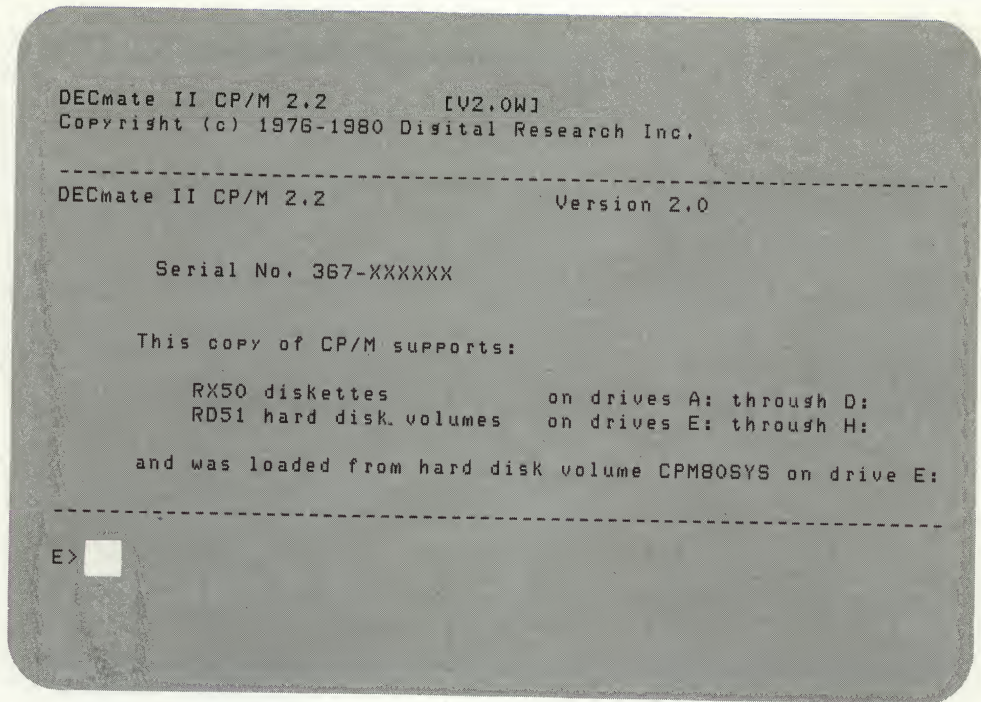
The DECmate II system first determines that it cannot start a diskette in drive A. It then starts the hard disk and boots the CP/M system startup volume. The message, CP/M loading..., appears, followed by the CP/M startup messages, the CP/M startup banner, and E> prompt.

Your screen looks like Screen 16.

NOTE: *If you have used the SETSTART command to create a different STARTUP program, you may see a different display than the CP/M startup banner shown in Screen 16.*

When the E> prompt appears on the screen, you have started the the DECmate II hard disk system with the CP/M startup volume. You can enter any of the CP/M commands described in the *DECmate II CP/M User's Guide*. Or, you can install a software product, such as MBASIC or Multiplan. Specific instructions are included in the Getting Started Card for each software product.

If you do not see the CP/M startup messages and E> prompt on the display screen, refer to the Problems with Startup section later in this chapter.



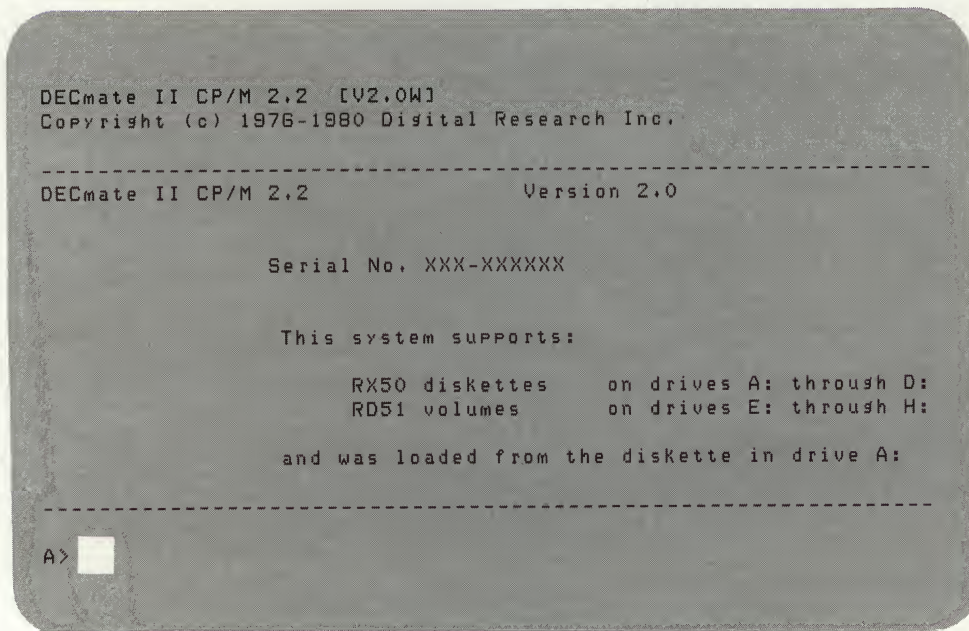
Screen 16

Starting CP/M From an Alternate Type System Diskette. Use this procedure when your DECmate II system is on and you want to start the CP/M operating system from an alternate type CP/M system diskette. For example, use this procedure if you are running CP/M from a hard disk system volume and you want to run CP/M from an alternate type CP/M system diskette.

- 1 Press the **SET-UP** key. The User Selection menu appears on the screen.
- 2 Press the **REMOVE** key.
- 3 Open the drive doors, if they are closed, and remove the diskettes, if any. Store the diskettes in their protective envelopes.
- 4 Insert an alternate type CP/M System Diskette into drive A. Close the door to drive A, and press the **DO** key.

- 5 The message, CP/M loading..., appears, followed by the CP/M startup messages, the CP/M startup banner, and A> prompt.

Your screen looks like Screen 17.



Screen 17

NOTE: If you have used the *SETSTART* command to create a different *STARTUP* program, you may see a different display than the CP/M startup banner shown in Screen 17.

When the A> prompt appears on the screen, you can enter any of the CP/M commands described in the *DECmate II CP/M User's Guide*. Or, you can install a software product, such as MBASIC or Multiplan. Specific instructions are included in the Getting Started Card for each software product.

If you do not see the CP/M start up messages and A> prompt on the display screen, refer to the Problems with Startup section later in this chapter.

Starting CP/M When Your Hard Disk System is Off

Use this procedure if you have installed CP/M on your DECmate II hard disk system by creating a CP/M system volume or an alternate type CP/M system diskette and your DECmate II system is off. Now you want to start the system. Refer to the appropriate section below for instructions.

Starting CP/M From a Startup Volume . Perform the following steps:

- 1 Open the drive doors.
- 2 Turn on any equipment connected to the system unit (for example, a printer).
- 3 Press the system unit power switch to the on (1) position. If the power switch is already on, turn it off, wait four seconds, and then turn it on again.
- 4 Your DECmate II system takes about 25 seconds to determine that it cannot start a diskette in drive A. It then starts CP/M from the CP/M startup volume.

The message, CP/M loading..., appears, followed by the letters ABCDEFG, the CP/M version number and copyright notice, the CP/M startup banner, and E> prompt. Your screen looks like Screen 16 above.

When the E> prompt appears on the screen, you can enter any of the CP/M commands described in the *DECmate II CP/M User's Guide*. Or, you can install a software product, such as MBASIC or Multiplan. Specific instructions are included in the Getting Started Card for each software product.

If you do not see the CP/M startup messages and E> prompt on the display screen, refer to the Problems with Startup section later in this chapter.

Starting CP/M From an Alternate Type System Diskette . Perform the following steps:

- 1 Open the drive doors and remove any diskettes.
- 2 Turn on any equipment connected to the system (for example, a printer).

- 3 Insert the CP/M system diskette into drive A but *do not close the drive door*.
- 4 Press the unit power switch to the on (1) position. If the power switch is already on, turn it off, wait four seconds, and turn it on again.
- 5 *Immediately* close the door to drive A.

The message, CP/M loading..., appears, followed by the letters ABCDEFG, the CP/M version number and copyright notice, the CP/M startup banner, and A> prompt. Your screen looks like Screen 17 above.

When the A> prompt appears on the screen, you can enter any of the CP/M commands described in the *DECmate II CP/M User's Guide*. Or, you can install a software product, such as MBASIC or Multiplan. Specific instructions are included in the Getting Started Card for each software product.

If you do not see the CP/M startup messages and A> prompt on the display screen, refer to the section Problems with Startup later in this chapter.

Problems With Startup

If you have started your DECmate II system and do not see the CP/M prompt:

- Check the screen brightness and contrast control knobs on the rear of the video monitor and adjust them if necessary.
- Check the lights on the keyboard. If the HOLD SCREEN light (top row of keyboard) is on, press the **HOLD SCREEN** key to turn it off.
- Check the cables that connect your DECmate II system unit to the keyboard and display screen. Make sure that they are securely fastened at both ends.
- Remove the CP/M system diskette from drive A, turn off the system, and repeat the startup procedure.

If you see a number on the screen, your DECmate II system detected a problem during the startup procedure. Refer to the *DECmate II Owner's Manual* (Order number: EK-DECM2-OM-001) for information on how to correct the problem.

If the problem persists, refer to Chapter 7, What to Do in Case of Trouble.

Stopping the DECmate II Hard Disk System

When you are finished using your DECmate II system for the day:

- 1 Back up (or copy) any hard disk volumes that you have changed (added or deleted information). Use the HD utility program Back Up option described in Chapter 6.

This is very important. If you are not in the habit of backing up your hard disk volumes, you risk losing data files or the contents of a volume—even the contents of the entire hard disk—if an error occurs.

- 2 Press the system unit power switch to the off (0) position.
- 3 Turn off any equipment connected to the system unit.

NOTE: *Never turn the system power on or off while diskettes are in the drives and the drive doors are closed. This may erase information on the diskettes.*

Updating CP/M 2.2, Version 1.0 System Diskettes

If you have created CP/M 2.2, Version 1.0 system diskettes especially to run applications programs, you will want to update the CP/M operating system on these diskettes without altering the other programs and files on the diskettes. To do this, perform the following steps:

- 1 Use the CP/M installation diskette and a blank diskette to create a CP/M 2.2, Version 2.0 system diskette. The process for doing this was described earlier in this chapter.
- 2 Be sure to create the appropriate type of system CP/M diskette. If your system includes diskette drives only (RX50s or RX01s), create a standard type CP/M system diskette. If your system includes an RD51 hard disk subsystem, create an alternate type CP/M system diskette.
- 3 Use the STAT command to create alphabetical lists of the files on both the old and new diskettes. (Use the command STAT X:.* twice, once for each diskette. X designates the drive containing the diskette.) The STAT command is discussed in Chapter 3.

Compare the two lists of files. Write down the names of the files that are on Version 1.0 system diskette (the old diskette) and are not on the new system diskette.

- 4 Use the PIP command (also discussed in Chapter 3) to copy **ONLY** the files that appear on the old system diskette and do not appear on the new system diskette. Copy the files one at a time.

Be sure that you **DO NOT COPY** any files from the old diskette which are on the new diskette.

NOTE: *The CP/M operating system on a Version 2.0 system diskette is slightly larger than the operating system on a Version 1.0 system diskette. If your old system diskette is very full, you may need to delete some of the CP/M transient commands or utility programs you use infrequently in order to fit all of your application programs and data files onto the diskette.*

Viewing the CP/M System Diskette or Volume Directory

You can check the contents of the CP/M system diskette, or the CP/M system volume if you have a hard disk system, by viewing the diskette or volume directory. To display the directory:

- Start up your DECmate II system. Make sure the CP/M prompt is on the screen.
- Type **DIR**.
- Press the **RETURN** key.

The contents of a newly-created, standard type CP/M system diskette display as shown in Screen 18.


```

A>DIR
A:  ASM          COM : DDT          COM : DISKCOPY    COM : DISKINIT COM
A:  DUMP         ASM : DUMP        COM : ED          COM : GREETING COM
A:  LOAD        COM : PIP          COM : PRSETUP    COM : SETSTART COM
A:  STARTUP     COM : STAT        COM : SUBMIT     COM : WPSCONV  COM
A:  XSUB        COM
A>

```

Screen 18

The contents of a newly-created, alternate type CP/M system diskette display as shown in Screen 19.

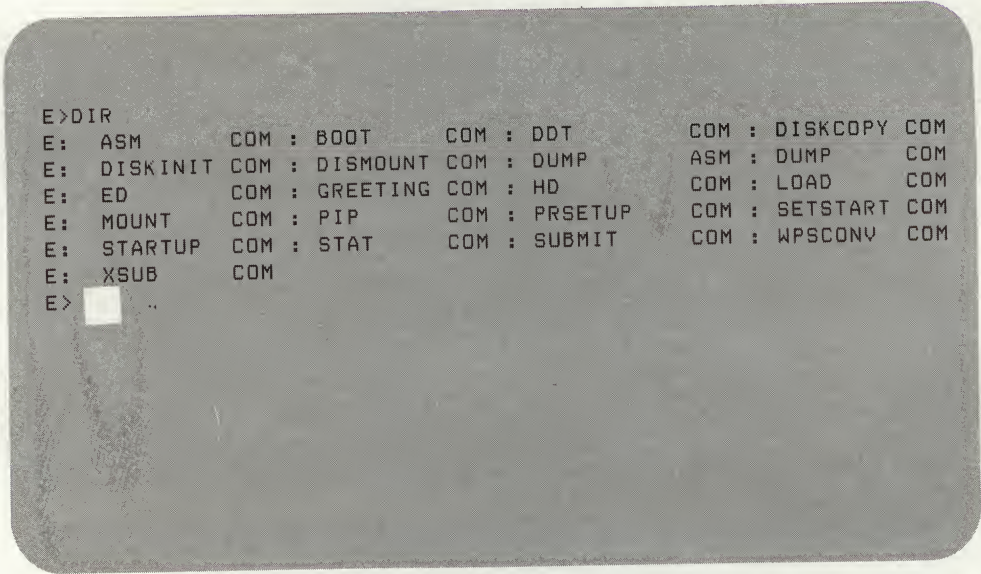
```

A>DIR
A:  ASM          COM : DDT          COM : DISKCOPY    COM : DISKINIT COM
A:  DISMOUNT     COM : DUMP        ASM : DUMP        COM : ED          COM
A:  GREETING     COM : HD          COM : LOAD        COM : MOUNT        COM
A:  PIP          COM : PRSETUP    COM : SETSTART    COM : STARTUP    COM
A:  STAT        COM : SUBMIT     COM : WPSCONV    COM : XSUB        COM
A>

```

Screen 19

The contents of a newly-installed, CP/M system volume display as shown in Screen 20.



```
E>DIR
E:  ASM          COM : BOOT      COM : DDT      COM : DISKCOPY COM
E:  DISKINIT     COM : DISMOUNT  COM : DUMP     ASM : DUMP     COM
E:  ED           COM : GREETING  COM : HD      COM : LOAD     COM
E:  MOUNT        COM : PIP       COM : PRSETUP  COM : SETSTART COM
E:  STARTUP      COM : STAT      COM : SUBMIT   COM : WPSCONV  COM
E:  XSUB         COM
E>
```

Screen 20

The DECmate II Keyboard

The DECmate II keyboard (see Figure 9) resembles a standard typewriter keyboard. If CP/M is running and waiting for a command, pressing a letter or a number key causes the corresponding character to display on the screen at the *cursor*.

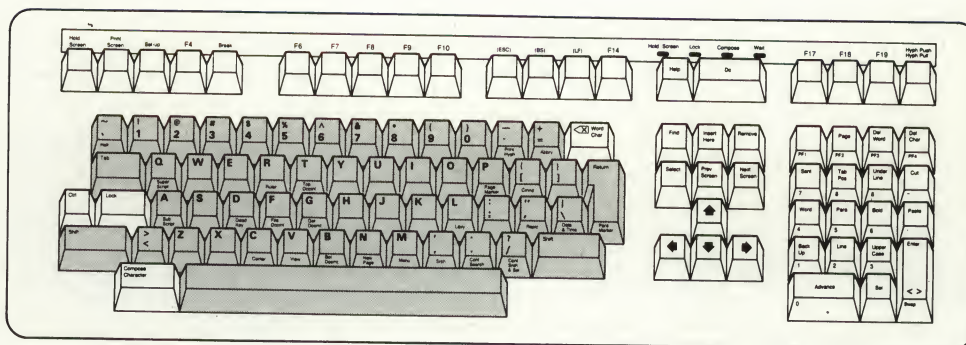


Figure 9 The DECmate II Keyboard

The main difference between a standard typewriter keyboard and the DECmate II keyboard is the additional keys that the DECmate II system provides. The shaded keys in Figure 9 are the same for both keyboards. Except for the RETURN key—which has a special meaning to CP/M—these keys function as they do on a typewriter.

NOTE: The LOCK key affects only the letter keys on the DECmate II keyboard. It is not the same as the SHIFT LOCK key on most typewriters. When you press the LOCK key, the LOCK light on the keyboard lights and every letter you type is capitalized. Press the LOCK key again to unlock capitalization.

The unshaded DECmate II keys fall into three categories:

- Keys that are invisible to CP/M,
- Keys that CP/M displays but does not understand, and
- Keys that CP/M responds to in special ways.

Keys that are Invisible to CP/M

Table 1 lists the keys that are invisible to CP/M. Even though the keys have no meaning to CP/M, your DECmate II system itself responds when you press one of these keys.

Table 1 Keys that are Invisible to CP/M

Key	Location	Function
SET-UP	Special function keys	The SET-UP key lets you examine or change the way the DECmate II system operates. The SET-UP key is discussed later in this chapter.
HOLD SCREEN	Special function keys	<p>The HOLD SCREEN key "freezes" the screen—your DECmate II system will not display any new text. When you press the HOLD SCREEN key, the HOLD light on the keyboard comes on and the characters you enter do not appear on the screen, although your DECmate II system receives them normally. CP/M continues working until the first time it tries to display output on the screen. When it finds it cannot display, it simply waits.</p> <p>To release the screen, press the HOLD SCREEN key again. The HOLD light goes out, CP/M starts running again, and the screen immediately displays any text you may have entered while the screen was frozen.</p>
PRINT SCREEN	Special function keys	<p>When you have a printer properly connected to your system, this key "freezes" the screen and prints the contents of the screen on the printer.</p> <p>The PRINT SCREEN key prints the 94 visible ASCII characters and the blank character. All other characters are printed as blanks. Double-height characters are printed as two standard characters, one on top of the other. (This looks like two identical lines of text, one above the other.)</p>
COMPOSE CHARACTER	Main keyboard	This key has no effect on CP/M. It produces no characters on the screen and does not affect system operation.

Keys that CP/M Displays but Does Not Understand

CP/M does not understand the following keys:

- Any keys in the arrow keypad,
- The four keys at the top of the editing keypad (Gold, PAGE, DEL WORD, and DEL CHAR), and

- The special function keys in the top row, except for: HOLD SCREEN, PRINT SCREEN, SET-UP, (BS), and (LF).

When you press any one of these keys, CP/M displays a series of characters but takes no further action.

Although CP/M itself does not understand these keys, some applications programs do. The way an applications program responds to these keys depends on the program.

NOTE: When the characters `^[` appear together, they are called an escape character. This is what you see on the screen when you press (ESC), the *ESCAPE* key. Each of the keys discussed in this section produces an escape sequence—an escape character followed by one or more other characters.

Table 2 lists the location of and escape sequence produced by each of these keys.

Table 2 Keys that CP/M Displays but Does Not Understand

Key	Location	Characters Displayed
FIND	Arrow keypad	<code>^[1~</code>
INSERT HERE	Arrow keypad	<code>^[2~</code>
REMOVE	Arrow keypad	<code>^[3~</code>
SELECT	Arrow keypad	<code>^[4~</code>
PREV SCREEN	Arrow keypad	<code>^[5~</code>
NEXT SCREEN	Arrow keypad	<code>^[6~</code>
↑	Arrow keypad	<code>^[A</code>
↓	Arrow keypad	<code>^[B</code>
→	Arrow keypad	<code>^[C</code>
←	Arrow keypad	<code>^[D</code>
Gold	Numeric/editing keypad	<code>^[OP</code>
PAGE	Numeric/editing keypad	<code>^[OQ</code>
DEL WORD	Numeric/editing keypad	<code>^[OR</code>

(continued)

Table 2 Keys that CP/M Displays but Does Not Understand (cont.)

Key	Location	Characters Displayed
DEL CHAR	Numeric/editing keypad	^[OS
F4	Special function keys	^[14~
BREAK	Special function keys	^[15~
F6	Special function keys	^[17~
F7	Special function keys	^[18~
F8 (CANCEL)	Special function keys	^[19~
F9 (MAIN SCREEN)	Special function keys	^[20~
F10 (EXIT)	Special function keys	^[21~
(ESC)	Special function keys	^[
F14	Special function keys	^[26~
HELP	Special function keys	^[28~
DO	Special function keys	^[29~
F17	Special function keys	^[31~
F18	Special function keys	^[32~
F19	Special function key	^[33~
HYPH PUSH/PULL	Special function keys	^[34~

NOTE: Some CP/M utility programs do respond to the following keys: *F8 (CANCEL)*, *F9 (MAIN SCREEN)*, *F10 (EXIT)*, *DO*, *REMOVE*, *SELECT*, *PREV SCREEN*, *NEXT SCREEN*, and the *ARROW* keys. Refer to the individual program descriptions in Chapters 5, and 6 for more information.

Keys That CP/M Responds to in a Special Way

The following keys have special meaning to CP/M:

- The RETURN (<RET>) and Line Feed (LF) keys
- The WORD/CHAR (Rubout) and Backspace (BS) keys

This message indicates that you either did not insert a blank diskette into drive B or you did not close the door to drive B.

To correct the problem, insert a blank diskette into drive B, if there is no diskette in drive B, close the drive door, and press <RET>.

To cancel the copying operation and continue without correcting the problem, press <CTRL/C>. Then press F9, the MAIN SCREEN key, to return to the Installation menu.

```
Error while writing to System Disk
Error code = 2
```

```
Unable to complete CP/M on hard disk
```

```
Press MAIN SCREEN to recall the menu
```

This message indicates that you attempted to update a system volume and ran out of disk space during the update process.

If you delete infrequently used CP/M command files from the system volume to make room for more data files or a large applications program, you can overfill your volume during the update process. This results in the error condition shown above and leaves you with an incomplete volume.

To correct the problem, first, make a note of the CP/M file that was being copied when the error occurred. Then press F9, the MAIN SCREEN key, to return to the Installation menu. Start CP/M and (following the instructions in the following text) complete the update process manually.

The CP/M files are updated in alphabetical order as listed below:

```
ASM.COM
BOOT.COM
DDT.COM
DISKCOPY.COM
DISKINIT.COM
DISMOUNT.COM
DUMP.ASM
DUMP.COM
ED.COM
GREETING.COM
HD.COM
```

LOAD.COM
MOUNT.COM
PIP.COM
PRSETUP.COM
SETSTART.COM
STARTUP.COM
STAT.COM
SUBMIT.COM
WPSCONV.COM
XSUB.COM

The file that was being copied when the error occurred is incomplete. The files beyond it were not copied at all. If you want to include any of these files on your system volume, you must make room for them by deleting files. Use the following procedure:

- 1 Use the DIR command (discussed in Chapter 3) to display a list of the files that were copied onto the partially updated volume.
- 2 Use the ERA command (also discussed in Chapter 3) to to erase the files you do not want to include in your system volume.
- 3 Use the PIP command (also discussed in Chapter 3) to copy the files you want to include from the installation diskette onto your system volume.

Name already used on disk

Press RETURN to try again or CANCEL to recall the menu instead

This message indicates that the volume name you entered currently names a volume on the hard disk.

To correct the problem, press <RET> and enter another name.

To stop the operation and return to the Installation menu, press F8, the CANCEL key.

Named volume not found on disk

Press RETURN to try again or CANCEL to recall the menu instead

This message indicates that the name you entered is not the name of a volume on the hard disk.

To correct the problem, press <RET> and enter another volume name.

To stop the operation and return to the Installation menu, press F8, the CANCEL key.

Volume is not a CP/M system volume

Press RETURN to try again or CANCEL to recall the menu instead

This message indicates that the volume you selected is not a CP/M system volume.

To correct the problem, press <RET> and enter the name of a CP/M system volume.

To stop the operation and return to the Installation menu, press F8, the CANCEL key.

WRITE-PROTECTED disk in drive B, Press Ctrl-C OR remove tab and Press RETURN

This message indicates that the diskette you inserted into drive B is a write-protected diskette.

To correct the problem, remove the diskette from drive B and, if you want to write on the diskette, peel off the write-protect tab and reinsert the diskette into drive B. Close the door to drive B and press <RET>. Or, if you do not want to write on the diskette, press <CTRL/C>.

To cancel the copying operation and continue without correcting the problem, press <CTRL/C>. Then press F9, the MAIN SCREEN key, to return to the Installation menu.

Starting CP/M When Your Hard Disk System is On

Use one of these procedures if you have installed CP/M on your DECmate II hard disk system by creating a CP/M system volume or an alternate type CP/M system diskette, your system is on, and you want to start up your system.

You can also use one of these procedures when you want to change from one DECmate II operating system to another. Refer to the appropriate section in the following text for instructions.

Starting CP/M From the Startup Volume. Use this procedure when your DECmate II system is on and you want to start CP/M from the startup volume on the hard disk. For example, you would use this procedure if you had installed CP/M in the system startup volume, were operating your DECmate II system with an alternate type CP/M system diskette, and you wanted to run CP/M from a system volume.

Perform the following steps:

- 1 Press the **SET-UP** key. The User Selection menu appears on the screen.
- 2 Press the **REMOVE** key.
- 3 Open the drive doors, if they are closed, and remove the diskettes, if any. Store the diskettes in their protective envelopes.
- 4 Do not close the drive doors. Press the **DO** key.

The DECmate II system first determines that it cannot start a diskette in drive A. It then starts the hard disk and boots the CP/M system startup volume. The message, CP/M loading..., appears, followed by the CP/M startup messages, the CP/M startup banner, and E> prompt.

Your screen looks like Screen 16.

NOTE: *If you have used the SETSTART command to create a different STARTUP program, you may see a different display than the CP/M startup banner shown in Screen 16.*

When the E> prompt appears on the screen, you have started the the DECmate II hard disk system with the CP/M startup volume. You can enter any of the CP/M commands described in the *DECmate II CP/M User's Guide*. Or, you can install a software product, such as MBASIC or Multiplan. Specific instructions are included in the Getting Started Card for each software product.

If you do not see the CP/M startup messages and E> prompt on the display screen, refer to the Problems with Startup section later in this chapter.

DECmate II CP/M 2.2 [V2.0W]
Copyright (c) 1976-1980 Digital Research Inc.

DECmate II CP/M 2.2 Version 2.0

Serial No. 367-XXXXXX

This copy of CP/M supports:

RX50 diskettes on drives A: through D:
RD51 hard disk volumes on drives E: through H:

and was loaded from hard disk volume CPM80SYS on drive E:

E>

Screen 16

Starting CP/M From an Alternate Type System Diskette. Use this procedure when your DECmate II system is on and you want to start the CP/M operating system from an alternate type CP/M system diskette. For example, use this procedure if you are running CP/M from a hard disk system volume and you want to run CP/M from an alternate type CP/M system diskette.

- 1 Press the **SET-UP** key. The User Selection menu appears on the screen.
- 2 Press the **REMOVE** key.
- 3 Open the drive doors, if they are closed, and remove the diskettes, if any. Store the diskettes in their protective envelopes.
- 4 Insert an alternate type CP/M System Diskette into drive A. Close the door to drive A, and press the **DO** key.

- 5 The message, CP/M loading..., appears, followed by the CP/M startup messages, the CP/M startup banner, and A> prompt.

Your screen looks like Screen 17.

```
DECmate II CP/M 2.2 [V2.0W]  
Copyright (c) 1976-1980 Digital Research Inc.
```

```
-----  
DECmate II CP/M 2.2                      Version 2.0
```

```
Serial No. XXX-XXXXXX
```

```
This system supports:
```

```
    RX50 diskettes      on drives A: through D:  
    RD51 volumes       on drives E: through H:
```

```
and was loaded from the diskette in drive A:
```

```
-----  
A> 
```

Screen 17

NOTE: If you have used the *SETSTART* command to create a different *STARTUP* program, you may see a different display than the CP/M startup banner shown in Screen 17.

When the A> prompt appears on the screen, you can enter any of the CP/M commands described in the *DECmate II CP/M User's Guide*. Or, you can install a software product, such as MBASIC or Multiplan. Specific instructions are included in the Getting Started Card for each software product.

If you do not see the CP/M start up messages and A> prompt on the display screen, refer to the Problems with Startup section later in this chapter.

Starting CP/M When Your Hard Disk System is Off

Use this procedure if you have installed CP/M on your DECmate II hard disk system by creating a CP/M system volume or an alternate type CP/M system diskette and your DECmate II system is off. Now you want to start the system. Refer to the appropriate section below for instructions.

Starting CP/M From a Startup Volume . Perform the following steps:

- 1 Open the drive doors.
- 2 Turn on any equipment connected to the system unit (for example, a printer).
- 3 Press the system unit power switch to the on (1) position. If the power switch is already on, turn it off, wait four seconds, and then turn it on again.
- 4 Your DECmate II system takes about 25 seconds to determine that it cannot start a diskette in drive A. It then starts CP/M from the CP/M startup volume.

The message, CP/M loading..., appears, followed by the letters ABCDEFG, the CP/M version number and copyright notice, the CP/M startup banner, and E> prompt. Your screen looks like Screen 16 above.

When the E> prompt appears on the screen, you can enter any of the CP/M commands described in the *DECmate II CP/M User's Guide*. Or, you can install a software product, such as MBASIC or Multiplan. Specific instructions are included in the Getting Started Card for each software product.

If you do not see the CP/M startup messages and E> prompt on the display screen, refer to the Problems with Startup section later in this chapter.

Starting CP/M From an Alternate Type System Diskette . Perform the following steps:

- 1 Open the drive doors and remove any diskettes.
- 2 Turn on any equipment connected to the system (for example, a printer).

- 3 Insert the CP/M system diskette into drive A but *do not close the drive door*.
- 4 Press the unit power switch to the on (1) position. If the power switch is already on, turn it off, wait four seconds, and turn it on again.
- 5 *Immediately* close the door to drive A.

The message, CP/M loading..., appears, followed by the letters ABCDEFG, the CP/M version number and copyright notice, the CP/M startup banner, and A> prompt. Your screen looks like Screen 17 above.

When the A> prompt appears on the screen, you can enter any of the CP/M commands described in the *DECmate II CP/M User's Guide*. Or, you can install a software product, such as MBASIC or Multiplan. Specific instructions are included in the Getting Started Card for each software product.

If you do not see the CP/M startup messages and A> prompt on the display screen, refer to the section Problems with Startup later in this chapter.

Problems With Startup

If you have started your DECmate II system and do not see the CP/M prompt:

- Check the screen brightness and contrast control knobs on the rear of the video monitor and adjust them if necessary.
- Check the lights on the keyboard. If the HOLD SCREEN light (top row of keyboard) is on, press the **HOLD SCREEN** key to turn it off.
- Check the cables that connect your DECmate II system unit to the keyboard and display screen. Make sure that they are securely fastened at both ends.
- Remove the CP/M system diskette from drive A, turn off the system, and repeat the startup procedure.

If you see a number on the screen, your DECmate II system detected a problem during the startup procedure. Refer to the *DECmate II Owner's Manual* (Order number: EK-DECM2-OM-001) for information on how to correct the problem.

If the problem persists, refer to Chapter 7, What to Do in Case of Trouble.

Stopping the DECmate II Hard Disk System

When you are finished using your DECmate II system for the day:

- 1 Back up (or copy) any hard disk volumes that you have changed (added or deleted information). Use the HD utility program Back Up option described in Chapter 6.

This is very important. If you are not in the habit of backing up your hard disk volumes, you risk losing data files or the contents of a volume—even the contents of the entire hard disk—if an error occurs.

- 2 Press the system unit power switch to the off (0) position.
- 3 Turn off any equipment connected to the system unit.

NOTE: *Never turn the system power on or off while diskettes are in the drives and the drive doors are closed. This may erase information on the diskettes.*

Updating CP/M 2.2, Version 1.0 System Diskettes

If you have created CP/M 2.2, Version 1.0 system diskettes especially to run applications programs, you will want to update the CP/M operating system on these diskettes without altering the other programs and files on the diskettes. To do this, perform the following steps:

- 1 Use the CP/M installation diskette and a blank diskette to create a CP/M 2.2, Version 2.0 system diskette. The process for doing this was described earlier in this chapter.
- 2 Be sure to create the appropriate type of system CP/M diskette. If your system includes diskette drives only (RX50s or RX01s), create a standard type CP/M system diskette. If your system includes an RD51 hard disk subsystem, create an alternate type CP/M system diskette.
- 3 Use the STAT command to create alphabetical lists of the files on both the old and new diskettes. (Use the command STAT X:*. * twice, once for each diskette. X designates the drive containing the diskette.) The STAT command is discussed in Chapter 3.

Compare the two lists of files. Write down the names of the files that are on Version 1.0 system diskette (the old diskette) and are not on the new system diskette.

- 4 Use the PIP command (also discussed in Chapter 3) to copy ONLY the files that appear on the old system diskette and do not appear on the new system diskette. Copy the files one at a time.

Be sure that you DO NOT COPY any files from the old diskette which are on the new diskette.

***NOTE:** The CP/M operating system on a Version 2.0 system diskette is slightly larger than the operating system on a Version 1.0 system diskette. If your old system diskette is very full, you may need to delete some of the CP/M transient commands or utility programs you use infrequently in order to fit all of your application programs and data files onto the diskette.*

Viewing the CP/M System Diskette or Volume Directory

You can check the contents of the CP/M system diskette, or the CP/M system volume if you have a hard disk system, by viewing the diskette or volume directory. To display the directory:

- Start up your DECmate II system. Make sure the CP/M prompt is on the screen.
- Type **DIR**.
- Press the **RETURN** key.

The contents of a newly-created, standard type CP/M system diskette display as shown in Screen 18.

```

A>DIR
A:  ASM          COM : DDT          COM : DISKCOPY  COM : DISKINIT COM
A:  DUMP         ASM : DUMP        COM : ED        COM : GREETING COM
A:  LOAD        COM : PIP         COM : PRSETUP  COM : SETSTART COM
A:  STARTUP     COM : STAT        COM : SUBMIT    COM : WPSCONV  COM
A:  XSUB        COM
A>

```

Screen 18

The contents of a newly-created, alternate type CP/M system diskette display as shown in Screen 19.

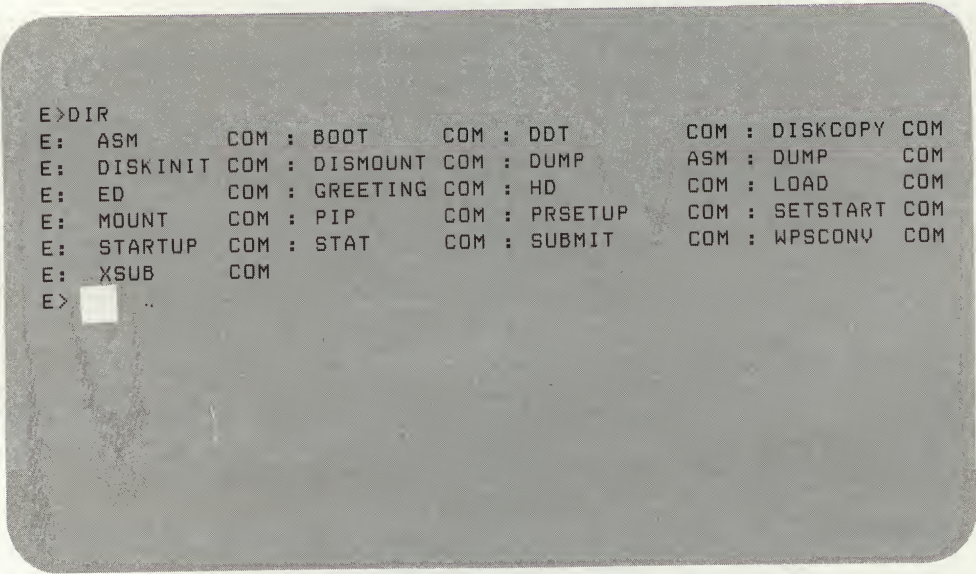
```

A>DIR
A:  ASM          COM : DDT          COM : DISKCOPY  COM : DISKINIT COM
A:  DISMOUNT     COM : DUMP        ASM : DUMP        COM : ED        COM
A:  GREETING     COM : HD          COM : LOAD        COM : MOUNT        COM
A:  PIP          COM : PRSETUP     COM : SETSTART    COM : STARTUP    COM
A:  STAT        COM : SUBMIT      COM : WPSCONV     COM : XSUB        COM
A>

```

Screen 19

The contents of a newly-installed, CP/M system volume display as shown in Screen 20.



```
E>DIR
E:  ASM      COM : BOOT      COM : DDT      COM : DISKCOPY COM
E:  DISKINIT COM : DISMOUNT  COM : DUMP     ASM : DUMP      COM
E:  ED       COM : GREETING  COM : HD      COM : LOAD      COM
E:  MOUNT    COM : PIP       COM : PRSETUP  COM : SETSTART  COM
E:  STARTUP  COM : STAT      COM : SUBMIT   COM : WPSCONV   COM
E:  XSUB     COM
E> ..
```

Screen 20

The DECmate II Keyboard

The DECmate II keyboard (see Figure 9) resembles a standard typewriter keyboard. If CP/M is running and waiting for a command, pressing a letter or a number key causes the corresponding character to display on the screen at the *cursor*.

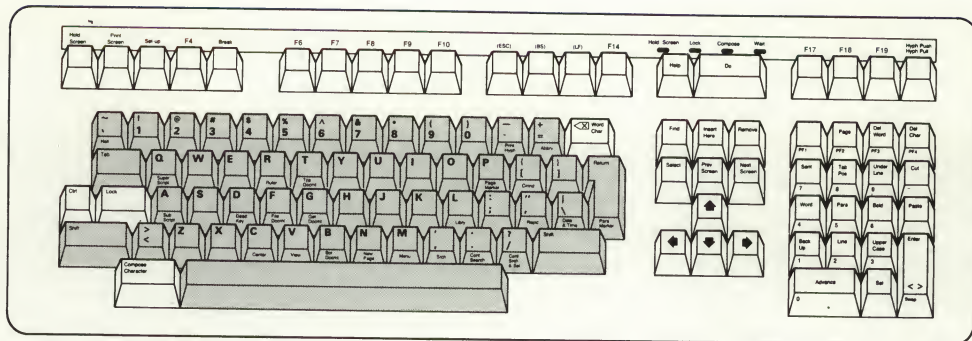


Figure 9 The DECmate II Keyboard

The main difference between a standard typewriter keyboard and the DECmate II keyboard is the additional keys that the DECmate II system provides. The shaded keys in Figure 9 are the same for both keyboards. Except for the RETURN key—which has a special meaning to CP/M—these keys function as they do on a typewriter.

NOTE: The **LOCK** key affects only the letter keys on the DECmate II keyboard. It is not the same as the **SHIFT LOCK** key on most typewriters. When you press the **LOCK** key, the **LOCK** light on the keyboard lights and every letter you type is capitalized. Press the **LOCK** key again to unlock capitalization.

The unshaded DECmate II keys fall into three categories:

- Keys that are invisible to CP/M,
- Keys that CP/M displays but does not understand, and
- Keys that CP/M responds to in special ways.

Keys that are Invisible to CP/M

Table 1 lists the keys that are invisible to CP/M. Even though the keys have no meaning to CP/M, your DECmate II system itself responds when you press one of these keys.

Table 1 Keys that are Invisible to CP/M

Key	Location	Function
SET-UP	Special function keys	The SET-UP key lets you examine or change the way the DECmate II system operates. The SET-UP key is discussed later in this chapter.
HOLD SCREEN	Special function keys	<p>The HOLD SCREEN key “freezes” the screen—your DECmate II system will not display any new text. When you press the HOLD SCREEN key, the HOLD light on the keyboard comes on and the characters you enter do not appear on the screen, although your DECmate II system receives them normally. CP/M continues working until the first time it tries to display output on the screen. When it finds it cannot display, it simply waits.</p> <p>To release the screen, press the HOLD SCREEN key again. The HOLD light goes out, CP/M starts running again, and the screen immediately displays any text you may have entered while the screen was frozen.</p>
PRINT SCREEN	Special function keys	<p>When you have a printer properly connected to your system, this key “freezes” the screen and prints the contents of the screen on the printer.</p> <p>The PRINT SCREEN key prints the 94 visible ASCII characters and the blank character. All other characters are printed as blanks. Double-height characters are printed as two standard characters, one on top of the other. (This looks like two identical lines of text, one above the other.)</p>
COMPOSE CHARACTER	Main keyboard	This key has no effect on CP/M. It produces no characters on the screen and does not affect system operation.

Keys that CP/M Displays but Does Not Understand

CP/M does not understand the following keys:

- Any keys in the arrow keypad,
- The four keys at the top of the editing keypad (Gold, PAGE, DEL WORD, and DEL CHAR), and

- The special function keys in the top row, except for: HOLD SCREEN, PRINT SCREEN, SET-UP, (BS), and (LF).

When you press any one of these keys, CP/M displays a series of characters but takes no further action.

Although CP/M itself does not understand these keys, some applications programs do. The way an applications program responds to these keys depends on the program.

NOTE: When the characters `^[` appear together, they are called an escape character. This is what you see on the screen when you press (ESC), the *ESCAPE* key. Each of the keys discussed in this section produces an escape sequence—an escape character followed by one or more other characters.

Table 2 lists the location of and escape sequence produced by each of these keys.

Table 2 Keys that CP/M Displays but Does Not Understand

Key	Location	Characters Displayed
FIND	Arrow keypad	<code>^[1~</code>
INSERT HERE	Arrow keypad	<code>^[2~</code>
REMOVE	Arrow keypad	<code>^[3~</code>
SELECT	Arrow keypad	<code>^[4~</code>
PREV SCREEN	Arrow keypad	<code>^[5~</code>
NEXT SCREEN	Arrow keypad	<code>^[6~</code>
↑	Arrow keypad	<code>^[A</code>
↓	Arrow keypad	<code>^[B</code>
→	Arrow keypad	<code>^[C</code>
←	Arrow keypad	<code>^[D</code>
Gold	Numeric/editing keypad	<code>^[OP</code>
PAGE	Numeric/editing keypad	<code>^[OQ</code>
DEL WORD	Numeric/editing keypad	<code>^[OR</code>

(continued)

Table 2 Keys that CP/M Displays but Does Not Understand (cont.)

Key	Location	Characters Displayed
DEL CHAR	Numeric/editing keypad	^[OS
F4	Special function keys	^[14~
BREAK	Special function keys	^[15~
F6	Special function keys	^[17~
F7	Special function keys	^[18~
F8 (CANCEL)	Special function keys	^[19~
F9 (MAIN SCREEN)	Special function keys	^[20~
F10 (EXIT)	Special function keys	^[21~
(ESC)	Special function keys	^[
F14	Special function keys	^[26~
HELP	Special function keys	^[28~
DO	Special function keys	^[29~
F17	Special function keys	^[31~
F18	Special function keys	^[32~
F19	Special function key	^[33~
HYPH PUSH/PULL	Special function keys	^[34~

NOTE: Some CP/M utility programs do respond to the following keys: F8 (CANCEL), F9 (MAIN SCREEN), F10 (EXIT), DO, REMOVE, SELECT, PREV SCREEN, NEXT SCREEN, and the ARROW keys. Refer to the individual program descriptions in Chapters 5, and 6 for more information.

Keys That CP/M Responds to in a Special Way

The following keys have special meaning to CP/M:

- The RETURN (<RET>) and Line Feed (LF) keys
- The WORD/CHAR (Rubout) and Backspace (BS) keys

- The CTRL key
- The keys on the bottom four rows of the numeric/editing keypad

If you press any one of these keys, CP/M responds in a particular way. Information about these keys is summarized in Tables 3, 4, and 5.

Table 3 Keys that Terminate and Edit CP/M Commands

Key	Location	Function
RETURN	Main keyboard	<RET>, the RETURN key, terminates CP/M commands and the inputs to CP/M commands.
(LF)	Special function keys	Same as above, see RETURN.
WORD/CHAR	Main keyboard	WORD/CHAR, the Rubout key, erases characters. When you press WORD/CHAR, the erased character disappears and the cursor moves one space to the left.
(BS)	Main keyboard	Same as above, see WORD/CHAR.

NOTE: Throughout this guide, the WORD/CHAR key is referred to as the Rubout key.

CP/M lets you erase characters by repeated Rubout or Backspace operations until you reach the CP/M prompt. CP/M then stops responding to these keys. You cannot erase the prompt or any mistakes above the prompt.

Holding down the CTRL key and simultaneously pressing a letter key, generates a special form of the letter called a control code. This is symbolized as <CTRL/X>, where X represents the letter key. CP/M recognizes the control codes listed in Table 4.

Table 4 Control Codes Recognized by CP/M

Control Code	Meaning
<CTRL/C>	Restarts the system if you type it at the beginning of a line. This is called a <i>warm start</i> . (See Chapter 2.)
<CTRL/E>	Permits starting a new line while deferring execution of the preceding line.
<CTRL/H>	Produces a Backspace. The same as pressing (BS).
<CTRL/J>	Produces a Line Feed. The same as pressing (LF).
<CTRL/M>	Produces a RETURN. The same as pressing <RET>.
<CTRL/P>	Echos the screen display on the current LIST device until the next <CTRL/P>.
<CTRL/R>	Redisplays the current line with corrections.
<CTRL/S>	Similar to the HOLD SCREEN key but releases the screen as soon as you press any other key and does not light the HOLD SCREEN light. You should use the HOLD SCREEN key instead.
<CTRL/U>	Erases the present line in memory, and moves the cursor to the next line for further input. The line image remains on the screen.
<CTRL/X>	Same as <CTRL/U> but erases the line image from the screen.
<CTRL/Z>	Ends input from the keyboard. For example, when you are using PIP to copy a file from CON:, or when you are entering a string of characters in an ED command, use <CTRL/Z>.
<CTRL/Rubout>	Erases an entire line of text from memory and from the screen. The same as pressing <CTRL/X>.

The bottom four rows of keys on the numeric/editing keypad have numbers and other mathematical symbols printed on their lower faces. For CP/M, these editing keys are the same as the numerical keys on the main keyboard. For instance, if you press the PARA key, CP/M displays 5 on the screen. This arrangement gives you a second and more convenient way to enter numerical information. Table 5 lists the characters displayed by the numeric/editing keys.

Table 5 Numeric/ Editing Keys

Key	Character Displayed
UNDERLINE	9
TAB POS	8
SENT	7
BOLD	6
PARA	5
WORD	4
UPPERCASE	3
LINE	2
BACK UP	1
ADVANCE	0
SEL	. (period, or decimal point)
CUT	- (hyphen, or minus)
PASTE	, (comma)
<> (ENTER)	<RET> (the RETURN key)

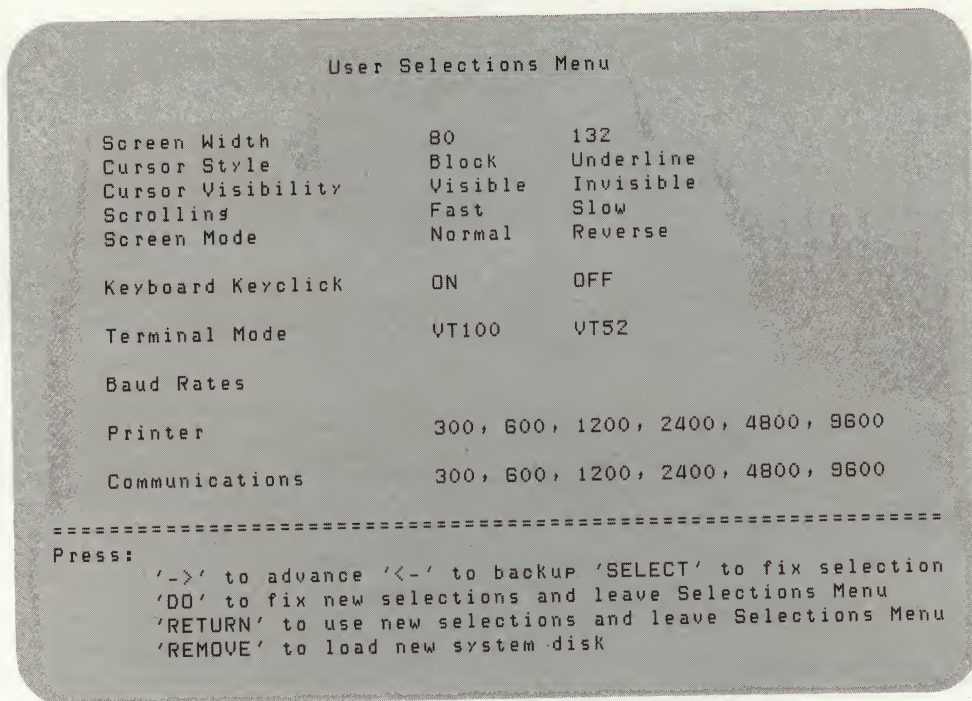
The SET-UP Key

The SET-UP key lets you change the DECmate II system manner of communication. When you press the SET-UP key, CP/M displays the User Selection menu (see Screen 21). By selecting items from this menu, you can change and store DECmate II system operating features.

Pressing the SET-UP key also initiates a process which lets you change system diskettes without turning off your DECmate II system. The new system diskette does not have to be a CP/M system diskette. Use this feature to start WPS (The Word Processing System) or any other DECmate II operating system when your DECmate II is on, and you are using CP/M.

If you have a hard disk system, pressing the SET-UP key initiates a process which lets you switch back and forth between operating from a hard disk system volume and operating from a system diskette.

NOTE: If you start your DECmate II system with a system diskette, remove the system diskette from drive A, and then press the SET-UP key, the system will not respond. Reinsert the system diskette into drive A, and the SET-UP key will work properly.



Screen 21

Changing Selection Settings

To change the User Selection settings:

- 1 Press the **right arrow** or **left arrow** keys on the arrow keypad to move the cursor to a menu item.
- 2 Press the **SELECT** key on the arrow keypad. The item you select now displays in reverse video.

- 3 Repeat steps 1 and 2 until you are through selecting operating features. Press either the RETURN or the DO key when you are done.
- If you press the **DO** key, the system stores the new settings. If you are using a system diskette, the DECmate II system stores your new settings on the system diskette. If you are using a hard disk and operating from a system volume, the DECmate II system stores your new settings on the Index volume on the hard disk. These settings are used whenever you start the DECmate II system from this system diskette or hard disk system volume.

When you press DO, the system displays this question:

Are you sure? Press **DO** key to confirm

To accept the selections, press the DO key again. Your DECmate II system stores the new settings and restores the information that was on the screen before you pressed the SET-UP key. If you change Screen Width, the screen will be blank after you leave the User Selection menu.

To change your selections, press any key *except* the DO key. The cursor goes back to the top of the menu and you can begin selecting again.

- If you press **<RET>**, the system uses the new settings only until you turn it off.

NOTE: When you are using a system diskette, the user selection menu items are stored on the diskette. Therefore, the user selection menu items can change any time you switch diskettes. When you are using a hard disk and operating from a system volume, the user selection menu items are stored on the Index volume. User selection menu items stored on the Index volume affect all volumes on the hard disk, and they do not change when you change system volumes.

The User Selection Menu Items

Each entry in the User Selection Menu is described in Table 6.

Table 6 User Selection Menu Entries

Entry	Function
Screen Width	Determines the number of characters displayed across the screen. If you select 80, the DECmate II system displays a maximum of 80 characters on a line. If you select 132, the system displays 132 characters on a line.
Cursor Style	Determines the type of cursor displayed on the screen. Select Block to display the cursor as a solid rectangle. Select Underline to display the cursor as an underscore character.
Cursor Visibility	Determines whether or not you see the cursor on your screen. Select Visible to display the cursor. Select Invisible not to display the cursor. <i>CP/M requires a visible cursor.</i>
Scrolling	Determines the upward or downward movement of lines on the screen. Select Fast to display each new line of text all at once. Select Slow to roll the text smoothly up the screen.
Screen Mode	Determines the screen background. Select Normal to display white characters on a black background. Select Reverse to display black characters on a white background.
Keyboard Keyclick	Turns on or off the click generated each time you press a key. Select ON to get the keyboard click. Select OFF to turn off the keyboard click.
Terminal Mode	Determines the terminal mode in which your DECmate II system will operate. Select VT100 to use ANSI escape sequences. Select VT52 to use DIGITAL escape sequences. <i>CP/M requires VT100 mode.</i>
Baud Rates	
-Printer	Controls how fast the DECmate II system sends data to the printer. Pick the setting that matches the baud rate of your printer (usually 4800 for DECmate II printers).
-Communications	Controls how fast the DECmate II system communicates with other computers through its communications port. Pick the setting that matches the setting on the other computer.

Changing System Diskettes

Use this procedure to change system diskettes without turning the DECmate II system off and then on again. The new system diskette can contain:

- The same operating system you are currently using but different applications programs or a different selection of transient commands or utilities.
- A different DECmate II operating system, such as WPS (the Word Processing System).

Perform the following steps:

- 1 Press the **SET-UP** key to display the User Selections menu if it is not displayed on the screen.
- 2 Press the **REMOVE** key on the arrow keypad. This message appears on your screen:

Insert new System Disk and Press 'DO'

NOTE: *If you decide not to change system diskettes at this time, press any key except the DO key.*

- 3 Open the drive A door and remove the system diskette.
- 4 Insert the new system diskette into drive A and close the drive door.
- 5 Press the **DO** key.

The system restarts using the new system diskette.

Switching Between Hard Disk System Volume and Diskette Operation

If your DECmate II hard disk system is operating from a system volume on the hard disk, you can use the SET-UP key to switch to diskette-based operation. The system diskette can contain:

- The same operating system that is on the hard disk system volume you are using.
- An operating system other than the one that is on the hard disk system volume you are using. The new operating system could be WPS (the Word Processing System).

Perform the following steps:

- 1 Press the **SET-UP** key to display the User Selections Menu on the screen.
- 2 Press the **REMOVE** key on the arrow keypad. The following message appears on the screen:

`Insert new System Diskette and Press 'DO'`
- 3 If the system diskette you want to use is not already in drive A, insert it and close the drive door.
- 4 Press the **DO** key.

The system restarts using the new system diskette.

If your DECmate II hard disk system is operating from a system diskette in drive A, you can use the SET-UP key to start the hard disk system with the designated startup volume.

Perform the following steps:

- 1 Press the **SET-UP** key to display the User Selections Menu on the screen.
- 2 Press the **REMOVE** key on the arrow keypad. The following message appears on the screen:

`Insert new System Diskette and Press 'DO'`
- 3 Open the door to drive A, remove the system diskette, and store it in its protective envelope.
- 4 Press the **DO** key without inserting a diskette into drive A.

The system restarts using the hard disk startup volume.

NOTE: *If you are using the SET-UP, REMOVE, DO sequence of key strokes to start a DECmate II system and you have a system diskette in drive A and the drive door is closed, your system will start from the system diskette. Otherwise, if you have a hard disk system and you do not have a system diskette in drive A or the door to drive A is open, your system will start from the hard disk startup volume.*

2

Using CP/M

This chapter explains how CP/M operates and provides practice examples which show you how to use the CP/M commands. You can get a good idea of the capabilities of CP/M by reading this chapter and working the examples at your keyboard. You do not have to work all of the examples, but doing so will familiarize you with the kinds of things CP/M can do.

What CP/M is and Does

CP/M stands for Control Program for Microprocessors. We call such a program an *operating system* because it governs all activities taking place in a computer. Many other programs that run on the DECmate II system do so under the control of CP/M.

When you want CP/M to do something, you communicate with it by typing commands on the keyboard. CP/M accepts commands for a variety of tasks, including:

- Listing the names of files on diskettes
- Copying the entire contents of diskettes
- Copying individual files
- Creating text files

- Displaying text files on the screen
- Printing files on a printer
- Deleting files
- Running programs

Starting CP/M

When you want to use CP/M, you must read it from the system diskette or hard disk volume into your DECmate II system memory. This is called starting the system. There are two ways to start the system: a *cold start* or a *warm start*.

You perform a cold start when:

- The power switch is OFF and you have to turn it ON before starting the system. Follow the directions for starting CP/M on a DECmate II system that is OFF. You will find these directions in Chapter 1. This procedure works for any DECmate II operating system; for example, WPS (the Word Processing System).
- The power switch is already ON, the system was previously started, and you want to start a system diskette or volume. Follow the directions for starting CP/M on a DECmate II system that is ON. You will find these directions in Chapter 1. This procedure will work for any DECmate II operating system; for example, WPS (the Word Processing System).

You perform a warm start when:

- The system was previously started, and you want to restart it. For example, you replaced a diskette in a drive without being told to do so by the program you were running. Or, some condition caused the system to stop. To perform a warm start, use a command called `<CTRL/C>`. Press the **CONTROL** key (CTRL on the keyboard) and hold it down while you type the letter **C**.

Whenever you perform a cold start, CP/M is brought into memory from the system diskette or volume and displays the CP/M startup messages, executes the `STARTUP.COM` program, and displays the CP/M prompt.

When you perform a warm start, CP/M is not brought into memory again; it is just reactivated and displays the CP/M prompt.

This manual tells you when to perform a cold or warm start.

Conversing with CP/M

When CP/M is ready to accept commands, it displays a prompt at the left side of the display screen. Because it can access up to eight drives, CP/M always prompts you with the name of the drive it is currently accessing (A through H) and a right angle bracket (>).

If you start your DECmate II system with a CP/M system diskette, the current (or *active*) drive is drive A, and the CP/M prompt displays as:

A>

If you start your DECmate II system with a CP/M hard disk system volume, the current (or *active*) drive is drive E, and the CP/M prompt displays as:

E>

When the CP/M prompt is displayed on the screen, CP/M is waiting for you to issue a command.

Issuing Commands

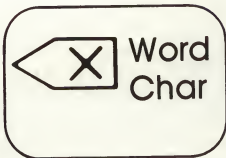
You can enter commands in upper-case or lower-case letters. CP/M converts all commands to uppercase text. After typing a CP/M command, you always press <RET> to tell CP/M that you want it to execute the command.

The symbol <RET> means that you should press the RETURN key. Some CP/M application programs indicate that you should press the RETURN key by displaying different messages, such as <CR> (for carriage return) or RETURN.

Correcting Typing Errors in Command Lines

If you make errors while typing commands, there are several ways to correct them as long as you have not pressed <RET>.

Rubout—The WORD-CHAR Key



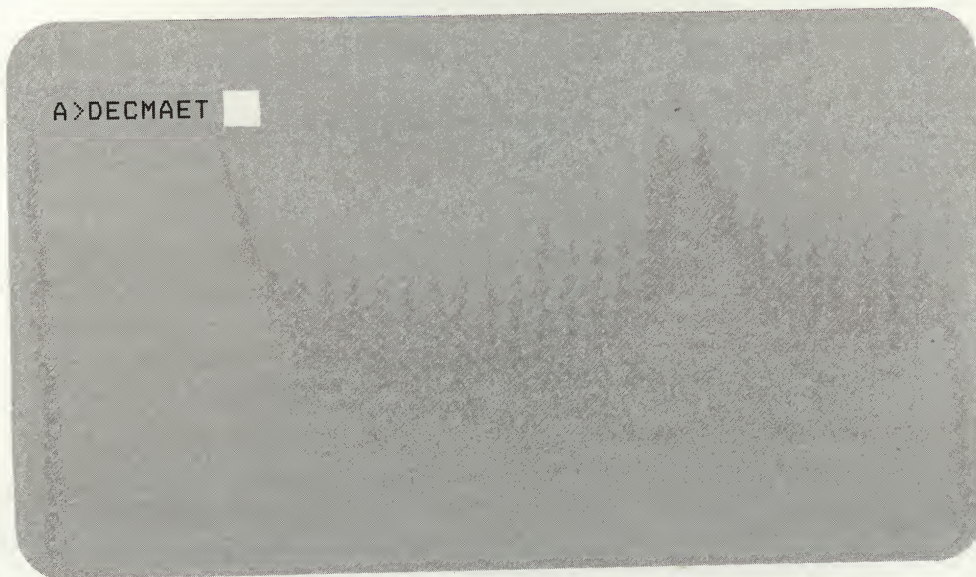
Pressing the Rubout key (WORD/CHAR) erases the last character you typed from the system memory and from the screen, and moves the cursor back a space. Each time you press the Rubout key, one character is erased and the cursor moves one space to the left. For example, type:

A> DECMAET

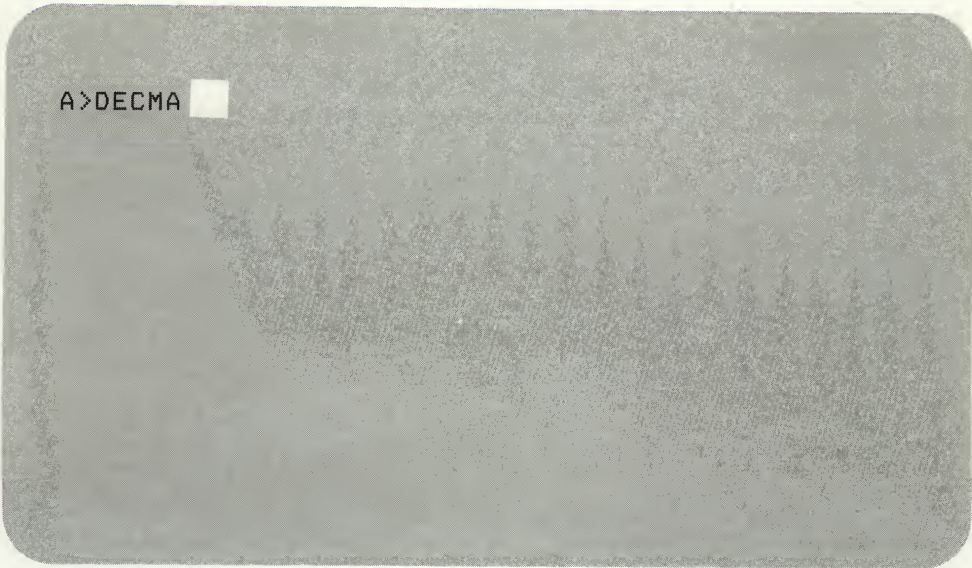
Now press the **Rubout** key twice. The characters T and E disappear, leaving you with DECMA. Type:

A> DECMAE

The screen displays DECMATE. Screens 22, 23, and 24 illustrate this sequence. Now press the **Rubout** key seven times to erase DECMATE.

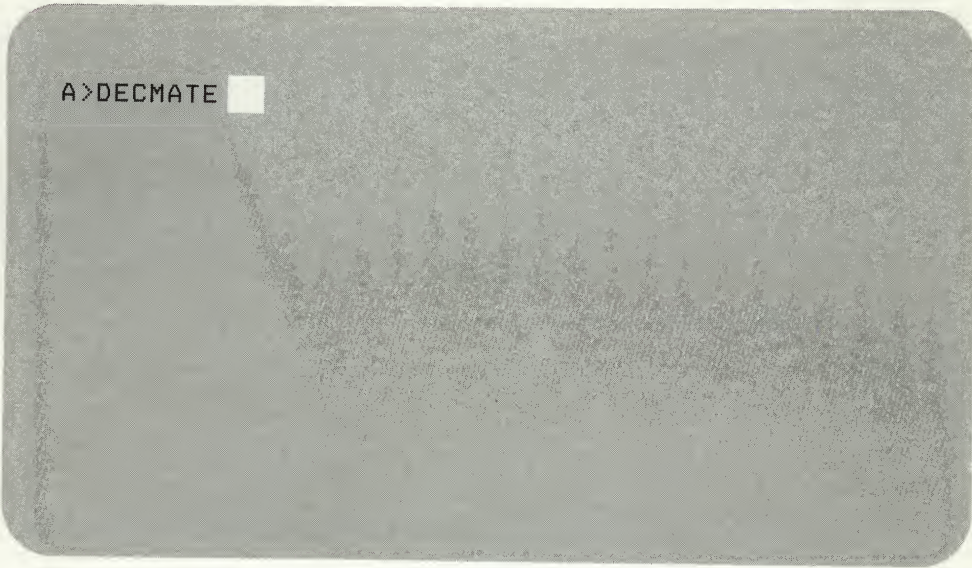


Screen 22



A>DECMA

Screen 23



A>DECMATE

Screen 24

<CTRL/X>

The CONTROL key (marked CTRL on the keyboard) is a special key that, when used in conjunction with another key, causes the system to perform special functions. For example, <CTRL/X> erases the entire command line back to the CP/M prompt. To see how <CTRL/X> works, type:

```
A>PERSONAL OFFICE COMPUTER
```

Now press <CTRL/X> by holding down the CTRL key and simultaneously typing the letter X. The entire line is erased, and only the prompt remains. See Screens 25 and 26.



Screen 25



Screen 26

<CTRL/U>

<CTRL/U> cancels the current command line and allows you to begin again on the line below. The line remains visible on the screen, but CP/M has no memory of it.

<CTRL/U> has the same effect as <CTRL/X> except that <CTRL/U> leaves the text on the display screen.

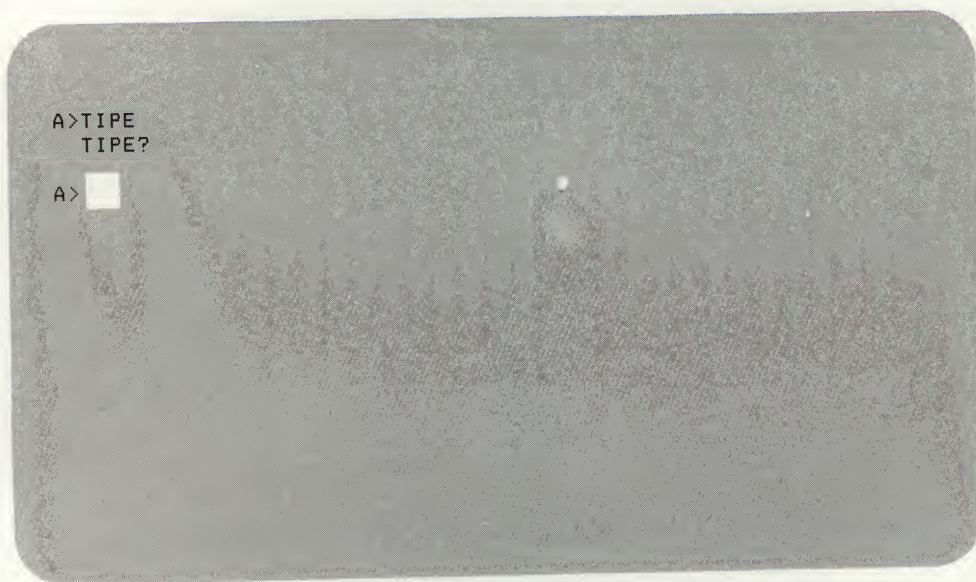
Error Messages

When CP/M displays its prompt, it is waiting for you to type a command. If you type something that CP/M does not understand, it displays an error message.

For example, if you enter **TIPE**<RET> when you mean TYPE<RET>, CP/M displays the message:

TIPE?

This means that it does not understand the command. See Screen 27.



Screen 27

Error messages appear for a variety of reasons. For example, you get an error message if you type a command incorrectly, type an invalid CP/M command, or neglect to enter some information CP/M needs to process the command.

It is not possible to anticipate all the conditions that can cause error messages; however, if you get an error message:

- Check for spelling errors and then retype the command correctly.
- Check the list of commands and utility programs at the beginning of Chapter 3 to determine whether or not the command you typed is a valid CP/M command or utility program.
- Refer to the discussion of the command or utility. Chapters 3, 4, 5, and 6 provide information on the CP/M commands and utility programs and the error messages unique to each. For convenience, the commands and utilities are arranged alphabetically and the error messages are listed at the end of each command description.
- Refer to the discussion of the installation process for your system in Chapter 1 for a list of the error messages that can occur while you are installing CP/M on your system.

A List of Error Messages

The following error messages appear when an error occurs while CP/M is running.

The paragraph that follows each error message explains the probable cause of the error and how to recover from it and continue using CP/M.

CP/M BOARD FAILURE

This message indicates that the CP/M board in your system failed the self-test during startup. Check to see that the CP/M board is properly installed in your system. Refer to the *DECmate II Installation Guide* (Order number: EK-DECM2-IN-001) for more information.

If the problem persists, there is a hardware problem with your CP/M board.

DISKETTE LOAD ERROR 1

This message indicates that an error occurred while 8BIOS (a part of CP/M) was being copied from the CP/M system diskette into the DECmate II system memory.

To correct the problem, turn the system off and cold start the system. Refer to the section Starting CP/M in this chapter for instructions in how to do this. Before you start the system, check to see that the diskette is correctly positioned in the drive by removing the diskette and reinserting it into the drive.

DISKETTE LOAD ERROR 2

This message indicates that an error occurred while the CP/M system image (a part of CP/M) was being copied from the CP/M system diskette into the DECmate II system memory.

To correct this problem, cold start the system using the SET-UP key. Refer to the section Starting CP/M in this chapter for instructions in how to do this. If the error persists, either your system diskette has been damaged, or there is a hardware problem with your drive.

DRIVE X NOT READY - Press Ctrl-C OR insert diskette, close door -
Press RETURN

This message indicates that the system was unable to read the diskette in the drive you named (X represents the name of the drive) because you did not put a diskette in the drive, you did not shut the drive door, or the drive you named is not installed in your system.

To correct this problem, first determine the nature of the problem. Then correct it.

- If there is no diskette in drive X, insert the proper diskette into drive X, close the drive door, and press **<RET>**.
- If the drive door is open, close it and press **<RET>**.

To cancel the command and continue without correcting the problem, press **<CTRL/C>**. The system displays another error message. Press **<CTRL/C>** again to display the CP/M prompt.

If you ignore the error message and press **<RET>**, or make a mistake while you are correcting the original error, a new error message appears. Press **<CTRL/C>** to display the CP/M prompt.

WRITE-PROTECTED DISK in drive X, Press Ctrl-C OR remove tab and
press RETURN

This message indicates that the system was unable to either write on or erase the diskette in the drive you named (X represents the name of the drive) because the diskette is write protected.

To correct the problem, remove the write-protected diskette from drive X and, if you want to write on the diskette, peel off the write-protect tab, reinsert the diskette into drive X, and press **<RET>**. Or, if you do not want to write on the diskette, press **<CTRL/C>**. Press **<CTRL/C>** again to display the CP/M prompt.

To cancel the command and continue without correcting the problem, press **<CTRL/C>**. The system displays another error message. Press **<CTRL/C>** again to display the CP/M prompt.

If you ignore the error message and press **<RET>**, or make a mistake while you are correcting the original error, a new message appears. Press **<CTRL/C>** to display the CP/M prompt.

DISK ERROR--drive X, track nn, sector nn, code 340: Disk upside-
down

This message indicates that you incorrectly inserted the diskette into the drive.

To correct the problem, press **<CTRL/C>** to display the CP/M prompt. Then remove the diskette and insert it correctly.

DISK ERROR--drive X, track nn, sector nn, code 200: Data CRC erro

This message indicates that CP/M tried to read the diskette in the drive you named (X represents the name of the drive), but could not make sense of the data.

To correct the problem, press **<CTRL/C>** to display the CP/M prompt. If the problem persists, try using a different diskette or inserting the diskette into a different drive.

DRIVE X not installed

This message indicates that you tried to access a drive (X represents the name of the drive), but the drive is not installed on your system.

To correct the problem, press **<CTRL/C>** to display the CP/M prompt. Then repeat the CP/M command. Be sure to specify a drive which is installed on your system.

NO CP/M BOARD INSTALLED

This message indicates that you attempted to start the CP/M operating system on a DECmate II system which does not include the optional CP/M board.

If you know that there is a CP/M board installed on your system, check to see that it is properly connected. Refer to the *DECmate II Installation Guide* (Order number: EK-DECM2-IN-001) for more information.

Bdos Err On X: Bad Sector

This message indicates that CP/M was unable to read from or write to a file on the diskette or volume in drive X. This message always follows a reverse video error message which explains the cause of the error.

To correct the error, follow the procedure for correcting the reverse video error message.

Bdos Err On X: Select

This message indicates that you told CP/M to use a drive which is either unready or does not exist. X represents the name of the drive you specified.

First, determine the nature of the problem, then try to correct it.

- If the drive you specified is unready, you will also see a reverse video error message. Follow the procedure for correcting this reverse video error message.
- DECmate II CP/M can address up to eight drives, designated A through H. If you specified a drive with a letter outside of this range, or you specified a drive that is not installed on your system, press **<CTRL/C>** to display the CP/M prompt.

Bdos Err On X: File R/O

This message indicates that you told CP/M to write in a file which has been designated Read/Only (R/O) with the STAT command. X represents the name of the drive you specified.

Press **<CTRL/C>** to display the CP/M prompt. Then use the STAT command to change the file access attribute from READ/ONLY to READ/WRITE. (See Chapter 3 for instructions in using the STAT command.)

Bdos Err On X: R/O

This message indicates that you told CP/M to write on a diskette which is Read/Only (R/O). X represents the name of the drive you specified.

Press **<CTRL/C>** to start over and display the CP/M prompt.

The most common cause of this message is that you attempted to write on a diskette that you have not properly logged into the system. While you are running CP/M, you should change diskettes ONLY if:

- You are told to do so by the program that you are running, or
- You perform a warm start press **<CTRL/C>** immediately after you change diskettes.

If you change a diskette without a subsequent **<CTRL/C>** and then only read from the diskette, you will not get an error message.

You will also see this error message if you tell CP/M to write on a diskette which has been temporarily set to R/O with the STAT command. When you press <CTRL/C>, CP/M performs a system warm start, the disk is changed to R/W, and you can write on it.

Hard Disk Error Messages

If you have installed an optional RD51 hard disk subsystem on your DECmate II system, you may see some of the following error messages.

```
ERROR ON HARD DISK--drive X, code n, cylinder n, head n,
sector n
```

This message indicates that there is a hardware problem with your hard disk subsystem. The information contained in this message locates the damaged area on your hard disk.

You cannot correct this problem. Copy the message and call your DECmate II vendor or, if you have an appropriate contact, your DIGITAL field service representative.

```
ERROR ON HARD DISK--drive X, volume not mounted
```

This message indicates that the system tried to read from or write to a volume on the drive you named (X represents the name of the drive), but no volume was mounted on the drive.

To correct this error, press <CTRL/C> to display the CP/M prompt. Then use the MOUNT command (or the Mount option of the HD utility program) to mount the volume you want to access on drive X.

```
ERROR ON HARD DISK--drive X, volume write-protected
```

This message indicates that the system tried to write on a volume that you designated as r-o (Read/Only) when you mounted it with the HD utility Mount option.

To correct this error, press <CTRL/C> to display the CP/M prompt. Then, using the DISMOUNT and MOUNT commands (or the Dismount and Mount options of the HD utility program), dismount the volume and remount it as a r-w (Read/Write) volume.

HARD DISK LOAD ERROR 1

This message indicates that an error occurred while 8BIOS (a part of CP/M) was being copied from the CP/M startup volume into the DECmate II system memory.

To correct this error, cold start the system. Follow the instructions for cold starting a DECmate II system that is turned off. These instructions are located in the section Starting CP/M in this chapter.

HARD DISK LOAD ERROR 2

This message indicates that an error occurred while the CP/M system image (a part of CP/M) was being copied from the CP/M startup volume into the DECmate II system memory.

To correct this error, cold start the system. Follow the instructions for cold starting a DECmate II system that is turned on. These instructions are located in the section Starting CP/M in this chapter.

If the error persists, either your system volume is damaged or there is a hardware problem with your drive.

Error Conditions

Sometimes, when the system encounters a condition it cannot deal with, it may not issue an error message. Instead, it may appear not to respond to anything you type. If this happens:

- First try to warm start the system.
- If that does not work, cold start the system.

File Storage

CP/M deals with a broad spectrum of information including programs, text, and data. All such information is organized in the form of files. Diskette storage is one method of storing files. If you have installed an RD51 hard disk subsystem, you may also store your files in volumes on the hard disk.

Storing Information on Diskettes

The computer stores files on a diskette and retrieves them by referencing tracks and sectors (see Figure 10). RX50 diskettes have 80 *tracks*, (numbered 0-79), each composed of ten *sectors* (numbered 1-10). Each sector stores 512 *bytes*, each byte representing one character such as a letter, a digit, or a symbol. Since each sector has a unique location on the diskette, the computer can find a particular sector on a particular track and store information in it or retrieve information from it.

Each diskette can store 390K bytes of information since CP/M reserves tracks 0 and 1 on all CP/M diskettes. (One K byte is 1024 bytes.) However, on a data diskette, only 386K bytes are available to you. CP/M needs the remaining 4K bytes for the file directory. The CP/M system diskette has 356K bytes available, since CP/M itself occupies 30K bytes.

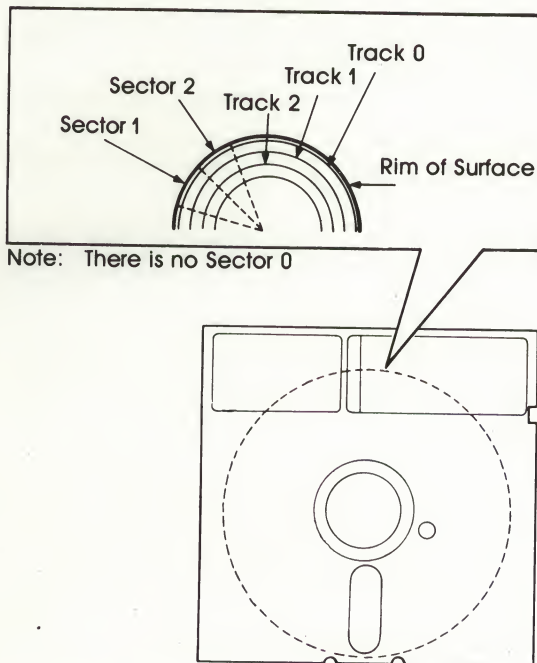


Figure 10 Tracks and Sectors on a Diskette

Using Diskettes

Because information on a diskette can be corrupted by accident, human error, or temperature and humidity, it is important to copy, or *back up*, diskettes. Thus, you generate working copies and store the originals, or *master diskettes*, as insurance against disaster. Always copy the installation diskette when you first receive it.

The CP/M diskette you create from your CP/M installation diskette is called a CP/M *system diskette* because it contains the CP/M operating system. Other diskettes, containing programs, the data generated by programs, or text, are called *data diskettes*. They should be copied periodically.

NOTE: *Never try to store information on tracks 74 through 79 of a system diskette. CP/M occupies these tracks. Never try to store information on tracks 0 and 1 of any diskette.*

Using Write-protect Tabs

If you put a self-sticking *write-protect* tab on a diskette, CP/M cannot write on that diskette. Write-protect tabs are provided by the manufacturer. Apply these tabs as shown in Figure 11. You can remove the write-protect tab at any time and return the diskette to its normal state.

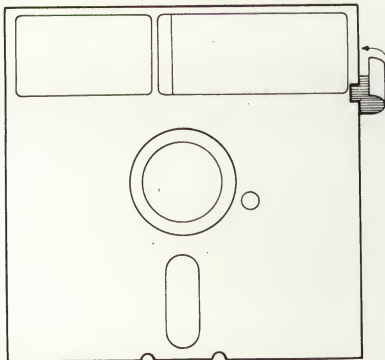


Figure 11 Applying a Write-Protect Tab

Initializing Diskettes

Before you use a new diskette, you must initialize it. This prepares the diskette for use by CP/M and sets up the file directory for the diskette. If a diskette has already been initialized by CP/M, you need not reinitialize it.

Initializing a previously-used diskette erases its contents and leaves it blank. Therefore, be careful that you do not initialize the wrong diskette. (The possibility of such an error, however, is an important reason for making copies of both your system diskette and all your data diskettes.)

CP/M can use three different kinds of diskettes:

- **RX50 format.** This is the most common format. Your DECmate II system can both read from and write to RX50 diskettes.

RX50 diskettes are 5¼ inches wide. They are single-sided, double density, with 80 tracks, 10 sectors per track, and 512 bytes per sector.

- **RX01 format.** Nearly all CP/M application programs are available on RX01 diskettes. Your DECmate II system can use RX01 diskettes if it has an RX01/RX02 adapter and an RX01 or RX02 dual diskette drive. You cannot use RX01 diskettes as system diskettes.

RX01 diskettes are 8 inches wide. They are single-sided, single density, with 77 tracks, 26 sectors per track, and 128 bytes per sector.

- **RX180 format.** Your DECmate II system can read and copy files from RX180 diskettes, but it cannot write on RX180 diskettes.

RX180 diskettes are 5¼ inches wide. They are single-sided, double density, with 40 tracks, 9 sectors per track, and 512 bytes per sector.

CP/M has a utility program, called DISKINIT.COM, to help you prepare diskettes in RX50 or RX01 format. You must initialize a diskette to do some of the exercises in this chapter. Use the following procedure to initialize your diskette:

- 1 Find a diskette with a blank label. Do not write-protect the blank diskette or you will not be able to initialize it. Have the diskette ready, but do not insert it into a drive.
- 2 Run DISKINIT by typing the responses shown in blue text in the dialog which follows. The dialog is summarized in Screen 28.

Make sure the CP/M prompt is on the screen. Type **DISKINIT** and press **<RET>**. The system displays the first several lines of Screen 28. The last line asks you:

Initialize disk in which drive [A..H]?

Answer by pressing **B**. Then press **<RET>**. If you accidentally type anything except **B**, use the Rubout key to correct your error.

The system displays:

Insert disk to be initialized in drive B and Press RETURN

```
DISKINIT --- Initialize CP/M Diskette for DECmate II ---
```

```
-----  
| WARNING--Destroys all data on the initialized disk |  
-----
```

```
Initialize disk in which drive [A..H]? B<RET>
```

```
Insert disk to be initialized in drive B and Press RETURN
```

```
Is this to be a CP/M SYSTEM or DATA disk [S/D]? D<RET>
```

```
Directory written
```

```
Initialize another disk [Y/N]? N<RET>
```

Screen 28

Insert the diskette into drive B, as the message says, close the door and press **<RET>**. The system displays:

Is this to be a CP/M SYSTEM or DATA disk [S/D]?

Answer by pressing **D**. Then press **<RET>**. The system displays:

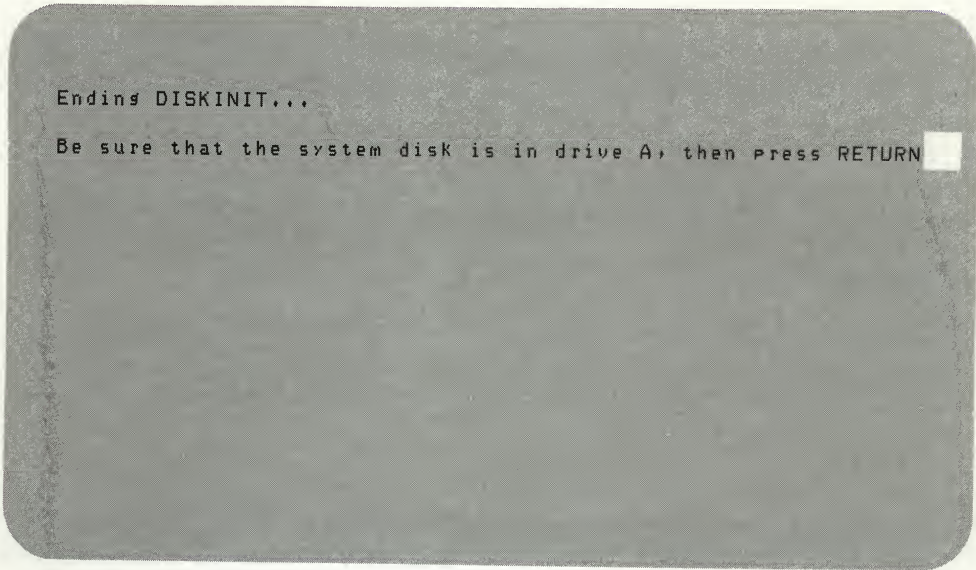
Writing directory...

When the directory is complete, the following message appears:

```
Directory initialized
```

```
Initialized another disk [Y/N]?
```

Answer by pressing **N**. Then press **<RET>**. If you are running DISKINIT from a system diskette, the system displays Screen 29. If you are running DISKINIT from a hard disk system volume, you will not see the second message.



```
Ending DISKINIT...
```

```
Be sure that the system disk is in drive A, then press RETURN
```

Screen 29

Press **<RET>**. The system displays the CP/M prompt.

Copying Diskettes

For help in copying diskettes, refer to the DISKCOPY utility in Chapter 5.

Storing Information on the Hard Disk

The RD51 hard disk subsystem for DECmate II systems consists of a controller board set and the hard disk drive unit. The RD51 unit occupies the space in the DECmate II system unit otherwise used for the second set of RX50 diskette drives. The RD51 controller board set occupies the same slot as the RX01/RX02 controller board set. Therefore, if you install an RD51 hard disk drive, you will not be able to install either the second set of RX50 diskette drives or the optional RX01 diskette drives.

Before you can use your hard disk unit, you must physically install and format the hard disk subsystem. Instructions for performing these procedures are included in the *RD51 Hard Disk Subsystem Installation Guide* (Order Number: EK-DM2HD-IN-001). If you have not installed and formatted your hard disk subsystem, do so before you proceed.

When you format your hard disk, you prepare it so that it can be accessed by the DECmate II system. The formatting process breaks up each track on the hard disk into units called sectors and establishes an area called the Index volume in the first 64 sectors on the disk.

Formatting divides each track on the hard disk into 16 sectors. Each sector contains 512 bytes (characters) of information. The entire hard disk unit contains 1,224 tracks; this yields a storage capacity of 10,027,008 bytes or 10 megabytes (abbreviated 10Mb).

The Index volume contains information that the DECmate II system needs in order to access information stored in hard disk volumes. You can see this volume name listed in a directory of volumes on the disk but you cannot look at or alter this volume.

Using the Hard Disk

In order to allow different operating systems and application programs to use the hard disk without interfering with each other, you must divide the hard disk into areas called *volumes*. Volumes are ranges of physically adjacent sectors on the hard disk. Hard disk sectors can belong to one and only one volume. If a range of sectors does not belong to a volume, it is included in what is called *unused area* and cannot be accessed.

Each volume is characterized by a unique volume name (a string of eight characters), a volume size (a number of K bytes), and a volume origin (the location on the hard disk of the first sector of the volume). When a volume is created, it is marked for use with a particular operating system.

Creating and Accessing Volumes

Access to a volume is gained by associating the volume with a drive; this is called *mounting* the volume. Mounting a hard disk volume on a drive is analogous to inserting a diskette into a diskette drive. CP/M supports four drives for hard disk volumes denoted by the letters E, F, G, and H. Once a volume is mounted, you can inspect or alter the files and programs contained on the volume by using any of the available CP/M commands.

There are two types of volumes: system volumes and data volumes. CP/M system volumes contain a copy of the CP/M operating system and can be used to start the DECmate II system. CP/M system volumes can only be created by performing the installation process (See Chapter 1 for a description of this process). CP/M data volumes contain CP/M programs, data files, or text. CP/M data volumes can only be created by *allocation*. Use the Allocate option of the HD utility program to allocate CP/M data volumes. (See Chapter 6 for a discussion of this utility.)

When you create a CP/M volume, you select the size of the volume. The minimum size for a CP/M system volume is 200K bytes. The minimum size for a CP/M data volume is 64K bytes. Both types of volumes have a maximum size equal to 8192K bytes.

CP/M allocates space for files on a volume in units called *allocation blocks*. The size of the allocation block varies with the size of the volume. The size of the allocation block is 1K bytes for a small volume, 2K bytes or 4K bytes, or 8K bytes for a large volume.

The allocation increment on an RX50 diskette always equals 2K bytes. Thus, when you transfer a file between a diskette and a hard disk volume it can appear to grow or shrink. Use the STAT command (see Chapter 3) to check the size of the file; but compare the number of records the file occupies, not the number of bytes of storage space it occupies. The number of records will be the same.

Using Commands and Files

When you issue a command, you usually have to include a file specification. The file specification tells CP/M which file the command applies to and the location of the file (that is, the drive its diskette or volume resides in). If you do not specify a drive name, CP/M assumes that the file is on the current drive.

File Names and File Types

File names and file types distinguish electronic files on a diskette or volume in much the same way as labels on file folders distinguish paper files in a cabinet. CP/M files have a first name, called the file name, and a last name, called the file type (or extension). When both a file name and a file type are used, they are separated by a period. The following conventions apply to file names and file types:

- A file name and file type can include any combination of upper-case letters, numbers, and printable symbols except for: < > . , ; : = * ? [] and embedded spaces. Note that you should use only upper-case letters in file names and file types.
- If a file type is used, it must be separated from the file name by a period.
- A file name can include from one to eight characters.
- A file type can include from zero to three characters.

File types are often used to denote a class of files. The file type .COM, for example, identifies CP/M programs that you can run by typing the file name.

Following are some examples of valid file names:

XYZ.COM	X.Y
GAMMA.RAY	X.1
GAMMA.1	X
GAMMA	1
PAY-ROLL. +	

Looking at the File Directory—The DIR Command

Each diskette or volume that contains files also contains a file directory. The directory tells CP/M what files exist on a given diskette or volume. To obtain information about the contents of a diskette or volume, examine its directory by using the DIR command. To see what is on the CP/M system diskette, for example, type:

```
A>DIR<RET>
```

DECmate II displays all the files on the CP/M diskette in drive A, as shown in Screen 30. The files display without a period between the file name and file type. You must always include the period when creating and referring to files. Note also that files on each line in the directory are separated from one another by a colon (:).

```
A>DIR
A:  ASM      COM : DDT      COM : DISKCOPY  COM : DISKINIT COM
A:  ED       COM : FILDMP   COM : LOAD     COM : PIP      COM
A:  STAT     COM : SUBMIT   COM : XSUB     COM
A>
```

Screen 30

The DIR command lists the contents of the currently active diskette or volume. To examine the contents of another diskette or volume, specify its drive name. For example, to examine the contents of the diskette in drive B, first make sure there is an initialized diskette in drive B, then type:

```
A>DIR B:<RET>
```

CP/M lists the contents of the diskette in drive B.

If there are no files on an initialized diskette when you issue the DIR command, CP/M types:

```
NO FILE
```

If the drive you specify does not contain a diskette, or the drive door is open, the system issues the following message:

```
DRIVE X NOT READY - Press Ctrl-C OR insert diskette, close door -  
Press RETURN
```

The letter X represents the letter of the drive that caused the error.

Insert an initialized diskette into the drive, close the drive door, and press **<RET>**.

If you are using a hard disk system and you specify a drive which does not have a volume mounted on it, the system issues the following message:

```
ERROR ON HARD DISK -- drive X, volume not mounted
```

The letter X represents the letter of the drive that caused the error.

Press **<CTRL/C>** to display the CP/M prompt. Then use the MOUNT command (or the Mount option of the HD utility program) to mount the volume you want to access on drive X.

Changing the Current Drive

Unless you type a drive name when you issue a command, CP/M assumes that the files you want the command to act upon reside on the active diskette or volume, the diskette in the drive you are currently accessing. To describe this situation, we sometimes say that the current drive is the *default* drive, or that commands default to the current drive.

There are two ways of making commands apply to other drives:

- 1 Specify the drive name with the command, as you did when examining the directory on drive B. This method is useful when you want to do something briefly on another drive and then continue working on the current one.
- 2 Specify another drive name as the currently active one before issuing the command. If you want to work on the other drive for a length of time, perhaps to run a program and store its results on the diskette on that drive, this method is more convenient.

Any time the CP/M prompt is on the screen, you can direct CP/M to use a different default drive by typing the drive letter followed by a colon (:). If you are accessing a diskette drive, that drive becomes the current or default drive, and CP/M displays the appropriate prompt.

If your DECmate II system includes a hard disk subsystem and you are using an alternate type of CP/M system diskette, you can access hard disk drives in the same way. If there is a CP/M hard disk volume mounted on the hard disk drive you name, that drive becomes the current drive and CP/M displays the appropriate prompt.

If you start your system with a standard or alternate type system diskette and then access a drive other than drive A, you must leave the system diskette in drive A unless a program you are running instructs you to remove the diskette.

NOTE: *Do not attempt to change the current drive to a nonexistent or uninstalled drive. This will cause an error to occur. You will have to cold start the system.*

To access drive B before issuing the DIR command, be sure there is an initialized diskette in drive B, then type:

```
A>B:<RET>
```

CP/M displays:

```
B>
```


Drive B is now the current drive. If you now issue a command without specifying a location, the command defaults to drive B. For instance, type:

```
B>DIR<RET>
```

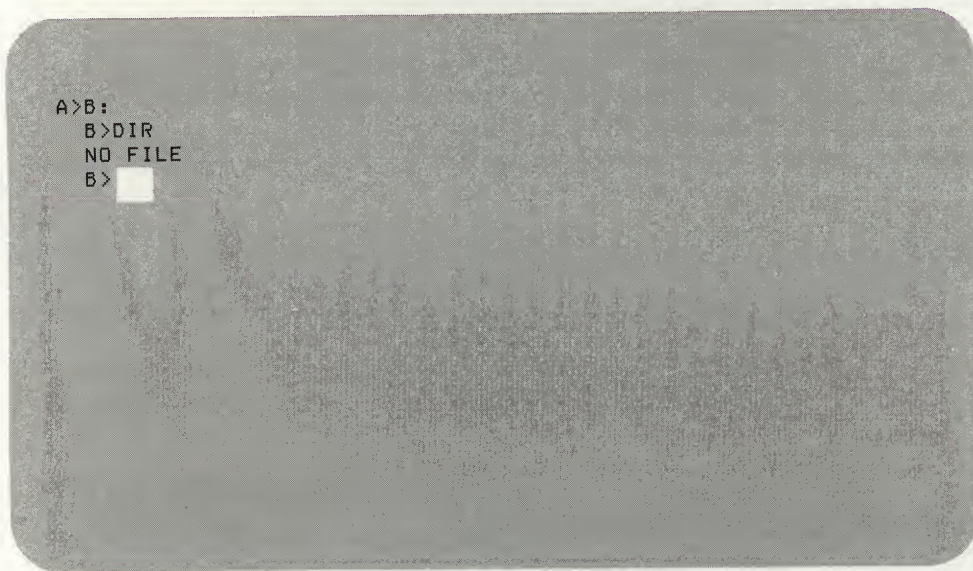
CP/M displays the directory of the diskette in drive B:

```
NO FILE
```

See Screen 31. Now get a directory of the system diskette in drive A. To do this, type:

```
B>DIR A:<RET>
```

The directory of the CP/M diskette in drive A appears. See Screen 32.



Screen 31

```
B>DIR A:
A:  ASM      COM : DDT      COM : DISKCOPY  COM : DISKINIT COM
A:  ED       COM : FILDMP   COM : LOAD     COM : PIP      COM
A:  STAT     COM : SUBMIT   COM : XSUB     COM
B>
```

Screen 32


You can use DIR to determine whether or not a specific file resides on any given diskette or volume. For example, to find the initialization program, DISKINIT.COM, which is on the diskette in drive A, specify the location and the name of the file. Type:

```
B>DIR A:DISKINIT.COM<RET>
```

CP/M displays:

```
A:  DISKINIT COM
```

as shown in Screen 33.



```
B>DIR A:DISKINIT.COM
A: DISKINIT COM
B>
```

Screen 33

Switch back to drive A by typing:

```
B>A:<RET>
```

CP/M again accesses drive A and displays its prompt:

```
A>
```

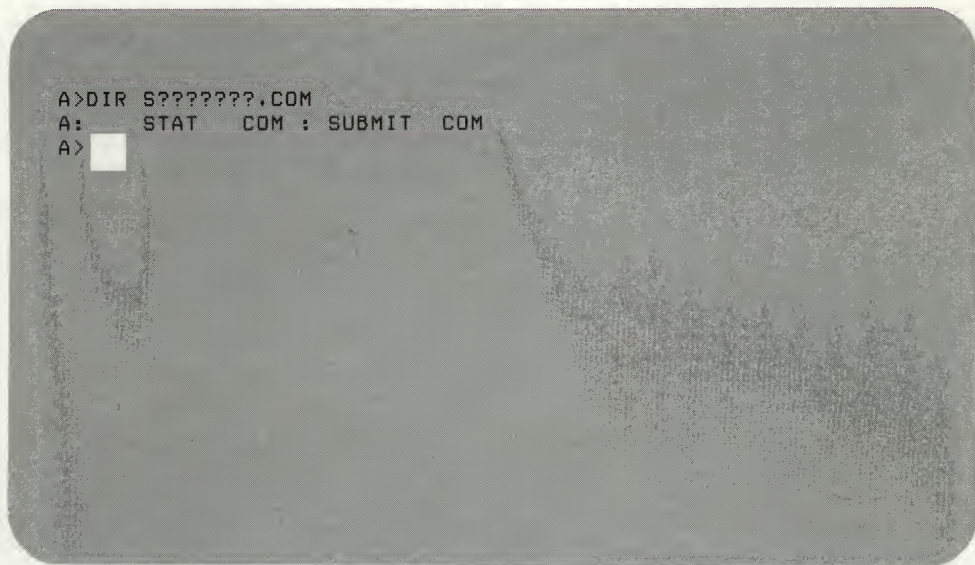
Using File References

A file reference identifies a particular file or group of files on a diskette. CP/M recognizes two kinds of file references, unambiguous file references (abbreviated ufn) and ambiguous file references (abbreviated afn). An unambiguous file reference identifies a specific file such as DISKINIT.COM or TEST.TXT. An ambiguous file reference identifies one or more files. Ambiguous file references are useful when, for example, you are searching for a file whose exact name you have forgotten, or when you want to issue a command to act on several files at once.

You use an ambiguous file reference by substituting a question mark (?) or an asterisk (*) for parts of an unambiguous file reference. Because they replace actual characters, these symbols are sometimes called *wild cards*. The question mark replaces individual characters in the same position as the question mark. For example, give the DIR command followed by an S, seven question marks, and the file type .COM. Type:

```
A>DIR S????????.COM<RET>
```

CP/M lists all files on the diskette in drive A that start with S and have a file type of .COM. Screen 34 shows the files.



Screen 34

The asterisk matches a group of characters instead of a single character, so that typing DIR *.COM<RET> causes CP/M to list all files (on drive A, the current drive) with a file type of .COM (see Screen 35).

```
A>DIR *.COM
A:  ASM      COM : DDT      COM : DISKCOPY  COM : DISKINIT COM
A:  ED       COM : FILDMP   COM : LOAD    COM : PIP      COM
A:  STAT     COM : SUBMIT   COM : XSUB    COM
A>
```

Screen 35

If you type `DIR *.*<RET>`, you see a list of all files on the diskette in drive A. This is the same as typing:

```
A>DIR<RET>
```

Note that while a file name cannot contain the symbols `?` and `*`, a file reference can.

Some CP/M commands can only be used with unambiguous file names. See Chapters 3, 4, 5, and 6 for more information.

The CP/M Commands and Utility Programs

CP/M recognizes two kinds of commands, resident and transient. Resident commands are built into CP/M. You cannot see them in the directory, but they are part of the CP/M operating system. Any time the system is running, you can use them. The resident commands that you will use most frequently are listed in Table 7.

Table 7 Frequently-Used CP/M Resident Commands

Command	Function of Command
DIR	Displays a directory.
ERA	Erases a file or files.
REN	Renames a file.
TYPE	Displays the contents of a file.

Transient commands exist as files on the system diskette or hard disk system volume because the programs for them are lengthier than those for the resident commands. Transient commands must be brought into the system memory before they can be used. Transient commands have the file type .COM. If such a file is on the diskette or hard disk volume in the current drive, you can invoke it by typing the file name. Otherwise, you must determine which diskette or hard disk volume it is on, load the diskette or hard disk volume in a drive, and specify that drive when you type the file name. Alternatively, you can copy the file to the current diskette or hard disk volume if space permits. The transient commands that you will use most frequently are listed in Table 8.

Table 8 Frequently-Used CP/M Transient Commands

Command	Function of Command
ED.COM	Creates and modifies text files.
PIP.COM	Copies files.
STAT.COM	Provides information about files and diskettes.

Utility programs, like transient commands, exist as files on the system diskette or hard disk system volume and must be brought into memory before they can be used. Utility programs also have the file type .COM. If the file for the utility program is on the diskette or hard disk volume in the current drive, you can invoke the utility program by typing the file name. Otherwise, you must determine which diskette or hard disk volume it is on, load the diskette or hard disk volume into a drive, and specify that drive when you type the file name.

Alternatively, you can copy the file to the current diskette or hard disk volume if space permits. The DECmate II utility programs are discussed in Chapters 5 and 6 of this manual.

The remainder of this chapter introduces a variety of the CP/M commands and encourages you to use them. However, the chapter does not provide extensive information about the commands, nor does it cover every one. For detailed information on each CP/M command and utility program, refer to Chapters 3, 4, 5, and 6.

Using CP/M Commands

Saving information in electronic files requires some understanding of how they are created, stored and used. It is equally important to know what operations can be performed upon files to make the most efficient use of file storage space and to facilitate the transfer of information between both diskettes and hard disk volumes.

To see how various commands affect files, create a test file on your CP/M system diskette or volume. If you are using a system diskette, make sure it is in drive A. If the system diskette is write-protected, remove the diskette from drive A and peel off the write-protect tab. Then, insert the diskette into drive A.

If your DECmate II system includes a hard disk and you are using an alternate type system diskette, follow the procedures exactly as they are stated. If you are using a hard disk system volume, your prompt will be E> rather than A>. Generally, you should perform the procedures exactly as they are stated. Any exceptions are noted.

Creating and Editing Files—The ED Command

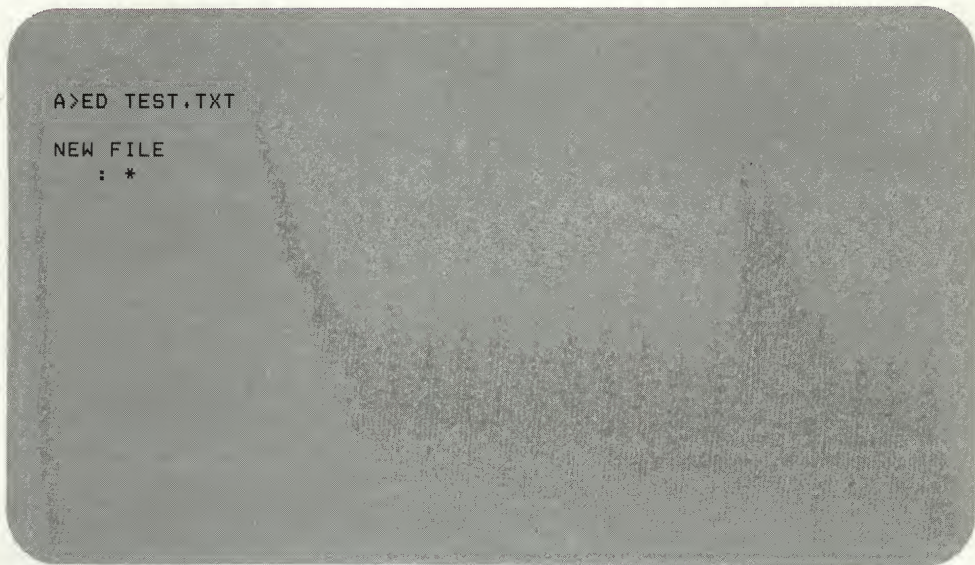
Aside from running programs, you may want to write reports, memos or letters and store them in files. Files of this sort are called *text* files because they consist of ordinary characters: letters, numbers, and symbols such as punctuation marks. Note that not all files are text files. Some files exist in forms understandable only to the computer. These go by various names, such as *machine language*, *binary*, or *executable* files. All of the programs for the CP/M transient commands are stored in this form.

To create a test file, run ED, the CP/M editor. An editor is a program for creating new text files or for modifying old ones.

Run the editor by typing the ED command and a file name. Create a file called TEST.TXT by typing:

```
A>ED TEST.TXT<RET>
```

See Screen 36. When you type the command, ED allocates an area in memory called the *text buffer*, which serves as a temporary workspace (see Figure 12).



Screen 36

At the end of your editing session, ED transfers the text from the text buffer to a file on the diskette or volume in the default drive and frees the area in memory. If no other file with the name TEST.TXT exists when you run ED, ED informs you that you have made a NEW FILE and creates the file TEST.TXT, along with a temporary file called TEST.\$\$\$\$. Both are empty. When you end the editing session, ED does the following:

- Renames TEST.TXT to TEST.BAK
- Moves text from the buffer into TEST.\$\$\$
- Renames TEST.\$\$\$ to TEST.TXT

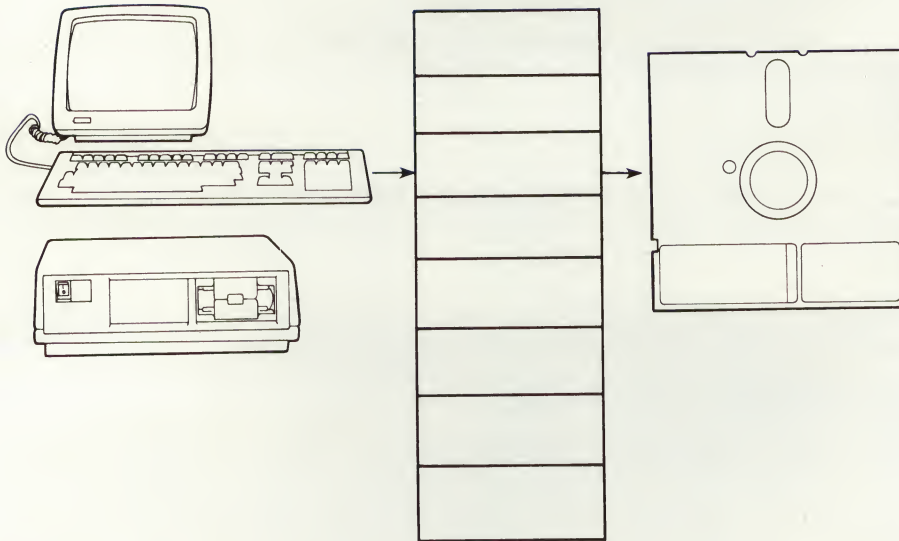


Figure 12 The ED Text Buffer

Thus, TEST.BAK becomes a *backup* copy containing the previous version of the file. In this case, since there was no previous version, TEST.BAK is empty. However, when you make future edits, the previous version becomes TEST.BAK and the new version becomes TEST.TXT. This feature ensures that you always have the next-to-the-last version of the file as well as the last version.

When ED is ready to accept commands and information, it prompts you with a colon (:), a space, and an asterisk (*):

: *

If TEST.TXT already existed, you would have to bring the text in from the diskette or volume to the text buffer before you could work on it. For this you would use the append command (#A) to append all text from TEST.TXT to the

buffer. TEST.TXT is called the *source file* because it is the source of text to be edited. For now, TEST.TXT is empty. Instruct ED that you want to insert text by typing:

```
: *I<RET>
```

ED gives you a blank line, numbered 1, and accepts all subsequent input as new text until you type <CTRL/Z>.

```
1:
```

Terminate every line of text you enter by pressing <RET>. Each time you press <RET>, ED gives you another numbered line. The line numbers help you locate information when you want to make changes, but they do not appear in the file when the editing session is over.

Insert the text printed in blue in the following example. Type everything exactly as you see it. Screen 37 shows what the display screen looks like when you do this. The text contains intentional errors for you to fix later. If you make additional errors, correct them by using the Backspace key or <CTRL/X>, or just leave them as is for the time being.

NOTE: *The Rubout key (WORD/CHAR) changes its behavior while you are running ED. It displays every character it removes from memory. If you use the Rubout key to erase the word MICE, the word MICEECIM appears on the screen.*

Type the text in blue:

```
H.?1: THIS REPORT OUTLINES COSTS FOR<RET>
2: LABORATORY MICEE AND EQUIPMENT USED<RET>
3: EXPERIMENTALLY FOR<RET>
4: IN EXPERIMENTS DURING JANUARY.<RET>
5: <CTRL/Z>: *
```

```
A>ED TEST.TXT  
NEW FILE  
: *I  
1: THIS REPORT OUTLINES COSTS FOR  
2: LABORATORY MICEE AND EQUIPMENT USED  
3: EXPERIMENTALLY FOR  
4: IN EXPERIMENTS DURING JANUARY.  
5:  
: *
```

Screen 37

Typing <CTRL/Z> signals ED that you are through inserting text and causes ED to display its prompt, which is an asterisk (*). ED then waits for further commands. Now you can correct errors and insert additional text.

To do so, however, you must be able to move back and forth in the buffer and locate portions of the file that require change. ED provides an imaginary character pointer (abbreviated CP) to help you maneuver. The CP is always in one of the following locations:

- Before the first character in the first line
- After the last character in the last line
- Between any two characters

When you finish inserting text, the CP is behind the last character you enter. In this exercise, the CP is at the bottom of the text buffer; that is, after the last character in the last line. It may help to think of the text buffer as a page in a book. Move the CP to the beginning of the buffer (page) by typing:

```
: *B<RET>
```


ED displays:

```
1: *
```

This indicates that the CP is now at the top of the buffer (see Screen 38). From anywhere in the buffer, you can always reach the top by typing B or the bottom by typing -B. If you move to the bottom of the buffer, ED displays : * (with no line number) to signal that the CP is at the bottom.

```
A>ED TEST.TXT
```

```
NEW FILE
```

```
  : *I
1:  THIS REPORT OUTLINES COSTS FOR
2:  LABORATORY MICEE AND EQUIPMENT USED
3:  EXPERIMENTALLY FOR
4:  IN EXPERIMENTS DURING JANUARY.
5:
  : *B
1: *
```

Screen 38

Use the T command to display lines from the buffer. If you just type T, ED displays the current line starting from where the CP is presently located. If you type 2T, ED displays the current line plus the line following it, and so on. If you want ED to display the whole buffer, first make sure the CP is located at the beginning of the buffer, then type:

```
1: ** T<RET>
```

ED displays the entire contents of the buffer on the screen as illustrated in Screen 39.

```
1: **T
1:  THIS REPORT OUTLINES COSTS FOR
2:  LABORATORY MICEE AND EQUIPMENT USED
3:  EXPERIMENTALLY FOR
4:  IN EXPERIMENTS DURING JANUARY,
1:  *
```

Screen 39

Note that although ED just displayed the whole buffer, the CP is still at the top of the buffer (that is, at the beginning of line 1). Line 2 in the file contains a misspelling. "MICEE" should be "MICE." Use the S command to make ED search for the error. ED moves the CP there and replaces the misspelled word with the correct one. Type:

```
1: *SMICEE<CTRL/Z>MICE<CTRL/Z><RET>
```

To see what the line looks like, use the B command to move the CP to the beginning of the buffer:

```
2: *B<RET>
```

Now type out the contents of the buffer to display the line and confirm that ED made the change:

```
1: **T<RET>
```

Screen 40 shows the corrected line.


```

1: *SMICEE^ZMICE^Z
2: *B
1: **T
1: THIS REPORT OUTLINES COSTS FOR
2: LABORATORY MICE AND EQUIPMENT USED
3: EXPERIMENTALLY FOR
4: IN EXPERIMENTS DURING JANUARY.
1: *

```

Screen 40

Sometimes it is necessary to delete entire lines from the file. Line 3, for example, is extraneous and should be removed. The L command tells ED how many lines to move the CP ahead in the buffer. Since the CP is now at the beginning of line 1, move ahead two lines to get to the beginning of line 3. Type:

```
1: *2L<RET>
```

ED moves the CP ahead two lines and displays:

```
3: *
```

This indicates that the CP is positioned on line 3. Use the K command to erase (kill) the line. Type:

```
3: *K<RET>
```

ED displays:

```
3: *
```

To confirm that the line was deleted, use the B command to move the CP to the beginning of the buffer. Then use the T command to display the entire contents of the buffer. Type:

```
3: *B<RET>
1: **T<RET>
```

ED displays the buffer, as illustrated in Screen 41. The line has been deleted, and all the lines renumbered.

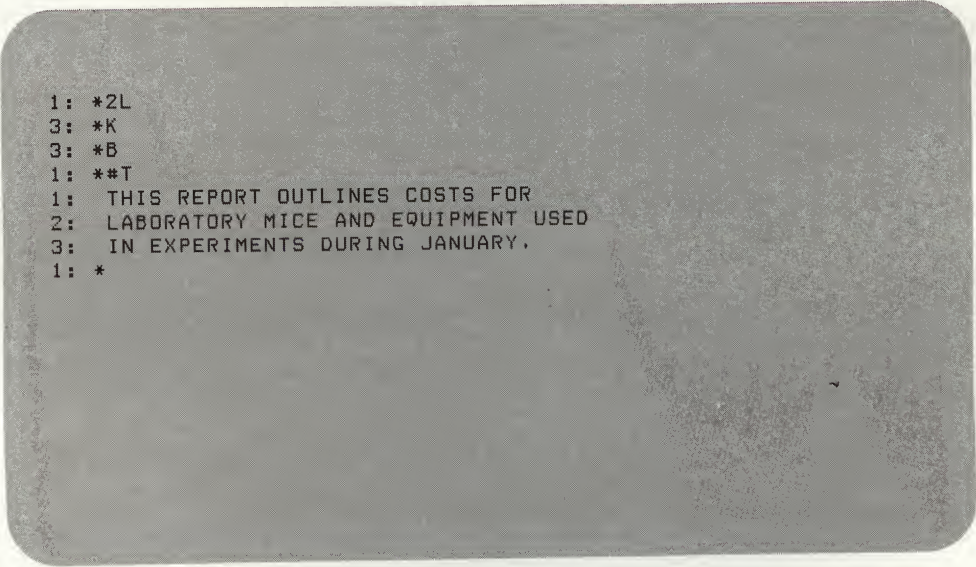
End the editing session by using the E command. This tells ED you are finished and want to save the file on disk. Type:

```
1: *E<RET>
```

When you exit the ED program, CP/M displays its prompt. Look at the directory to confirm that the files TEST.BAK and TEST.TXT are there. Type:

```
A>DIR<RET>
```

Screen 42 shows the directory. Your directory may not look exactly like screen 42, but TEST.TXT and TEST.BAK should be there.



```
1: *2L
3: *K
3: *B
1: **T
1:  THIS REPORT OUTLINES COSTS FOR
2:  LABORATORY MICE AND EQUIPMENT USED
3:  IN EXPERIMENTS DURING JANUARY.
1: *
```

Screen 41


```

1: *E

A>DIR
A: ASM      COM : DDT      COM : DISKCOPY  COM : DISKINIT COM
A: ED       COM : FILDMP   COM : LOAD    COM : TEST    BAK
A: PIP      COM : STAT    COM : SUBMIT   COM : XSUB    COM
A: TEST     TXT
A>

```

Screen 42

Examining Files—The TYPE Command

Text files are files intended to be read by people. Text files can be displayed on the DECmate II screen by means of the TYPE command. Use the command to examine TEST.TXT and TEST.BAK. To do this, type:

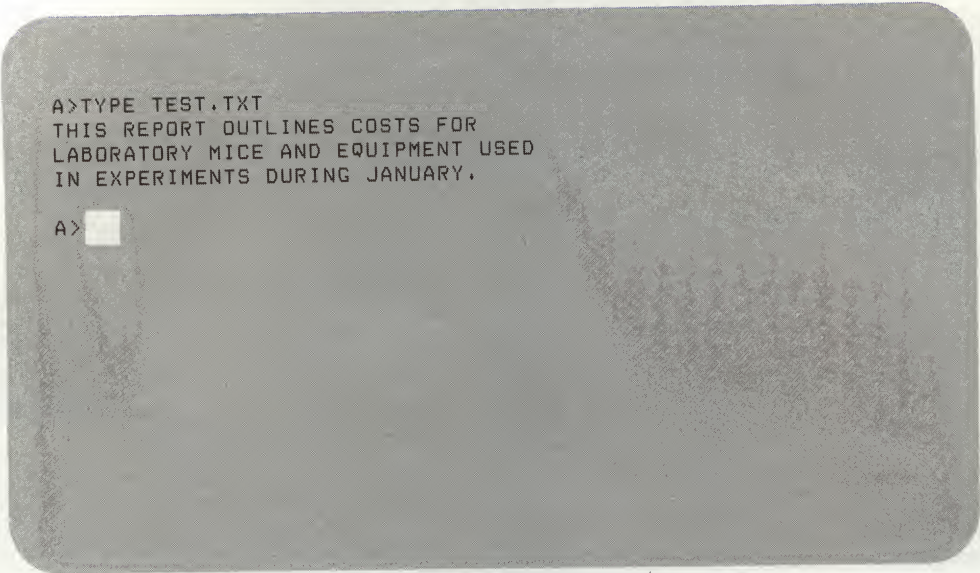
```
A>TYPE TEST.TXT<RET>
```

CP/M displays the contents of TEST.TXT as shown in Screen 43. Notice that the line numbers are gone.

When you display a long file, you might find that it scrolls by too quickly to read. In this case, you can temporarily halt the display by pressing the **HOLD SCREEN** key at the upper left corner of the keyboard. To resume scrolling, press the **HOLD SCREEN** key again.

Now instruct CP/M to type the contents of TEST.BAK. To do this, type:

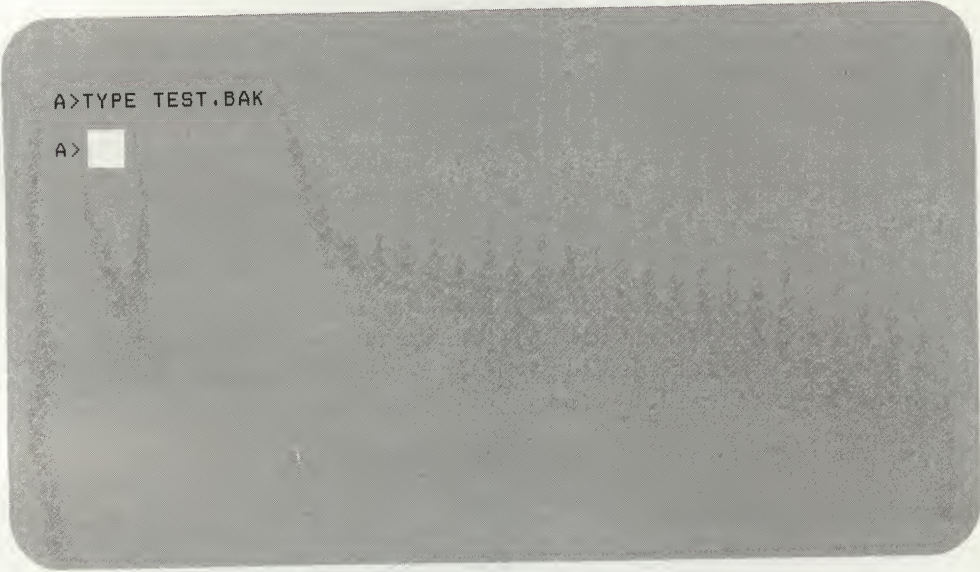
```
A>TYPE TEST.BAK<RET>
```

A screenshot of a CP/M terminal window. The text displayed is: A>TYPE TEST.TXT
THIS REPORT OUTLINES COSTS FOR
LABORATORY MICE AND EQUIPMENT USED
IN EXPERIMENTS DURING JANUARY.
A> [a small white square cursor is visible after the prompt A>].

```
A>TYPE TEST.TXT  
THIS REPORT OUTLINES COSTS FOR  
LABORATORY MICE AND EQUIPMENT USED  
IN EXPERIMENTS DURING JANUARY.  
A>
```

Screen 43

Since there is nothing in the file, CP/M has nothing to display. It issues its prompt and waits for another command, as shown in Screen 44.

A screenshot of a CP/M terminal window. The text displayed is: A>TYPE TEST.BAK
A> [a small white square cursor is visible after the prompt A>].

```
A>TYPE TEST.BAK  
A>
```

Screen 44

Changing File Names—The RENAME Command

When creating a file, you should give it a name that you can associate with the contents of the file. For example, TEST.TXT is very general and gives no clue as to the contents of the file. Since the report enumerates operating expenses for January, it might be better to call it COSTS.JAN.

The RENAME command lets you change the name of a file. To change the name of TEST.TXT to COSTS.JAN, type:

```
A>REN COSTS.JAN=TEST.TXT<RET>
```

Now use the DIR command to confirm that the change was made. Screen 45 shows what the directory looks like. Note that TEST.TXT has turned into COSTS.JAN, but TEST.BAK is unchanged. Remember, your directory will not look exactly like screen 45, but you will be able to see the files you renamed.

If you change the name of a file, be sure to rename the backup file as well. In this case, change TEST.BAK to COSTS.BAK. To do this, type:

```
A>REN COSTS.BAK=TEST.BAK<RET>
```

You can issue another DIR command to verify that the backup file was also renamed.

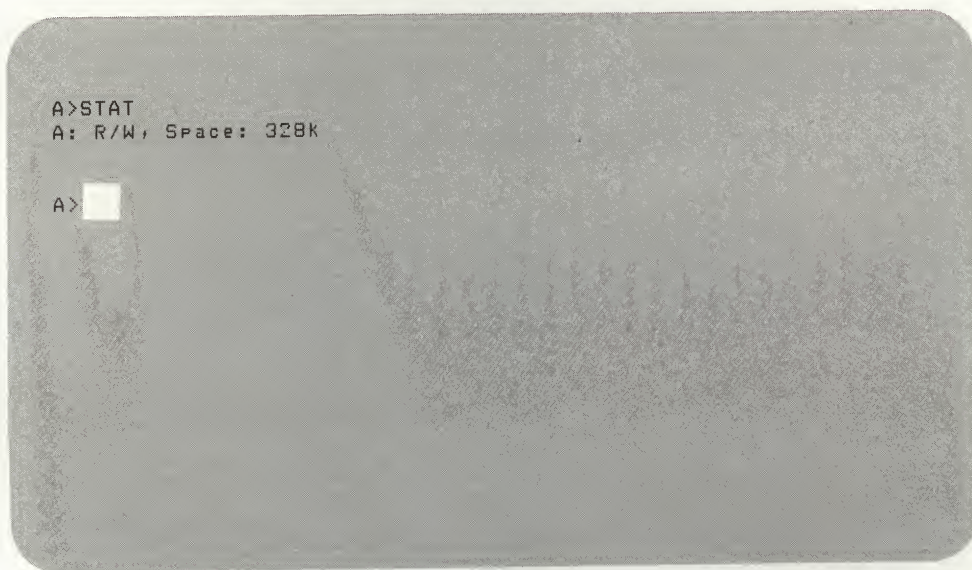
```
A>REN COSTS.JAN=TEST.TXT
A>DIR
A:  ASM      COM :  DDT      COM :  DISKCOPY   COM :  DISKINIT  COM
A:  ED       COM :  FILDMP   COM :  LOAD      COM :  TEST      BAK
A:  PIP      COM :  STAT     COM :  SUBMIT    COM :  XSUB      COM
A:  COSTS   JAN :
A>
```

Getting Information About Files—The STAT Command

As its name suggests, the STAT command provides statistics on files, such as the amount of space (in bytes) the files occupy on a diskette or volume. STAT can also tell you how much free space (in unused bytes) is on a particular diskette or volume. Get some information about the CP/M system diskette or hard disk system volume by typing:

```
A>STAT<RET>
```

STAT returns a message similar in form to the one in Screen 46. The message indicates that the diskette or volume is Read/Write; that is, it can be both read from and written to, and that some number of bytes (328K in this example) of unused space remain. Recall from the discussion of storing information that a byte is the amount of memory required to store a single character, and that 1K byte (1 kilobyte) equals 1,024 bytes.



Screen 46

Now get some information about COSTS.JAN. To do this, type:

```
A>STAT COSTS.JAN<RET>
```


Screen 47 shows the information that displays if you are using a diskette in drive A. This is only an example. You may see a slightly different display, but the form of the message should be the same.

Recs means *Record*. CP/M builds files by stringing records together, each of which contains 128 bytes. In this example, COSTS.JAN occupies no more than one record.

Bytes are the amount of memory used to store the file. In this example, COSTS.JAN requires 2K bytes (2 kilobytes) of storage space.

Ext is an *Extent*, which is a group of 256 records (for RX50 diskettes) or 128 records (for RX01 and VT180 diskettes). When CP/M created COSTS.JAN, it allocated one extent of directory space for that file. If COSTS.JAN becomes longer than 256 records, CP/M allocates another extent and *Ext* goes up to two.

Acc is the *Access Attribute* of the file. R/O means you can read the file; R/W means you can both read and write in the file. In this case, you can do both.

STAT also informs you that the file resides on the diskette in drive A, and that the diskette in drive A has 308K bytes of free space.

```
A>STAT COSTS.JAN
Recs  Bytes  Ext  Acc
   1    2K    1  R/W A:COSTS.JAN
Bytes Remaining On A: 308K
A> 
```

Screen 47

Copying Files—The PIP Command

The PIP (Peripheral Interchange Program) command lets you create copies of a file either on the current diskette or volume or on another diskette or volume. Such copying is useful if you want to change a file without altering the original, or if you want to make a backup copy of a file. Backup copies provide protection in case you accidentally delete the original file, or, if the file is on a diskette, you accidentally damage the diskette.

To see how PIP works, copy the COSTS.JAN file onto a diskette in drive B. You need to specify which drive contains the file to copy and which drive receives the copy. Insert an initialized diskette into drive B and type:

```
A>PIP B:COSTS.JAN=A:COSTS.JAN<RET>
```

If you are using a hard disk system with a system volume mounted on drive E> to do these examples, your COSTS.JAN will be on drive E. You should type E>PIP B:COSTS.JAN=E:COSTS.JAN<RET> instead. This command will copy your COSTS.JAN file from drive E to COSTS.JAN on drive B.

This command copies COSTS.JAN on drive A to COSTS.JAN on drive B. Now, examine the directory of drive B to verify that the copy was made. To do this, type:

```
A>DIR B:<RET>
```

COSTS.JAN appears in the directory as shown in Screen 48. Also examine the directory of the default drive. COSTS.JAN is there too.

When copying a file, you can give the copy a name different from the original. For instance, to make a copy of COSTS.JAN and call the copy REPORT.JAN, type the following command:

```
A>PIP REPORT.JAN=COSTS.JAN<RET>
```

The directory shows both files, as shown in Screen 49. The files are identical in content but different in name.


```
A>PIP B: COSTS.JAN=A: COSTS.JAN
```

```
A>DIR B:
```

```
B:  COSTS  JAN
```

```
A>
```

Screen 48

```
A>PIP REPORT.JAN=COSTS.JAN
```

```
A>DIR
```

```
A:  ASM      COM : DDT      COM : SISKCOPY  COM : DISKINIT  COM
```

```
A:  ED       COM : FILDMP   COM : LOAD      COM : COSTS   BAK
```

```
A:  PIP      COM : STAT     COM : SUBMIT    COM : XSUB     COM
```

```
A:  COSTS    JAN : REPORT   JAN
```

```
A>
```

Screen 49

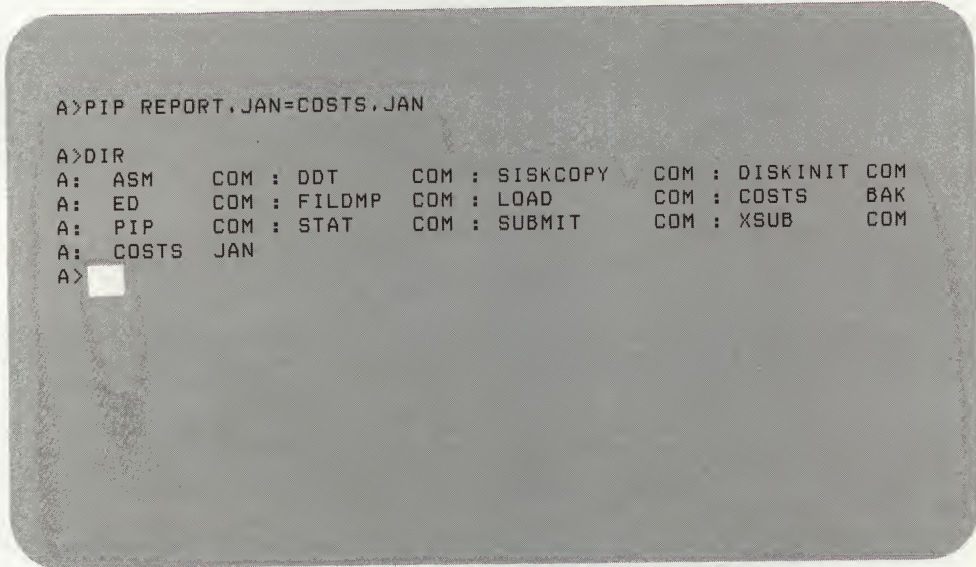
CAUTION: *If you copy a file and give it the name of a file that already exists, the existing file is replaced with the new file.*

Erasing Files—The ERA Command

Eventually, storage space becomes scarce as you continue to create text files or generate data by running programs. Therefore, you must free up space by erasing files that are no longer needed. The ERA command erases those files you no longer need. For example, to erase REPORT.JAN, type:

```
A>ERA REPORT.JAN<RET>
```

Screen 50 shows the results of searching the directory to verify that REPORT.JAN is gone.



```
A>PIP REPORT.JAN=COSTS.JAN
A>DIR
A:  ASM      COM : DDT      COM : SISKCOPY  COM : DISKINIT COM
A:  ED       COM : FILDMP   COM : LOAD    COM : COSTS   BAK
A:  PIP      COM : STAT    COM : SUBMIT  COM : XSUB    COM
A:  COSTS   JAN
A>
```

Screen 50

Running Applications Programs

DIGITAL supplies many applications programs and languages that run on the DECmate II system under CP/M, including general accounting and management tools, Multiplan, MBASIC, and RM/COBOL. Many other companies have also developed applications for CP/M. Because procedures for running such programs can vary, consult the appropriate documentation for operating instructions. Most applications programs have the file type .COM, and you can run them simply by typing their names.

The CP/M Commands

This chapter contains information on the basic CP/M command set. It begins with an overview of the complete set of CP/M commands and utility programs as defined below:

- Resident commands are built into the CP/M operating system. You cannot see them in the directory, but any time the system is running, these commands are in memory, and you can use them.
- Transient commands are not usually in memory when CP/M is running. Because the programs that execute them are more lengthy than those for the resident commands, transient commands exist as disk files. They must be brought into memory before they can be used. Transient commands have the file type .COM and show up as such in your system directory.
- Utility programs, also, are not usually in memory when CP/M is running. The utility programs are especially written for DECmate II CP/M users. Like transient commands, utility programs exist as disk files, and they must be brought into memory before they can be used. Utility programs have the file type .COM.

An advantage of transient commands and utility programs is that you can create system diskettes or hard disk volumes containing only the transient commands and utility programs you expect to use. This releases disk space for other storage purposes.

You give the command to execute a resident command by typing its name. For example, to see a directory of the files on the current drive, type:

```
A>DIR<RET>
```

You give the command to execute a transient command or utility program by typing its file name. Do not enter the file type. For example, to initialize a diskette you would type:

```
A>DISKINIT<RET>
```

In this chapter, transient command names are preceded by an asterisk (for example, *STAT) to distinguish them from those of resident commands.

Certain CP/M commands contained on your system diskette are briefly discussed in Chapter 4. These commands are associated with assembly language programming and debugging—an area of DECmate II applications not covered in this manual. If you want more information on these commands, order the complete set of Digital Research CP/M manuals directly from Digital Research. The address is listed in the preface to this manual.

The CP/M utility programs that can be used on any DECmate II system are discussed in Chapter 5.

The CP/M utility programs that can be used only on DECmate II hard disk systems are discussed in Chapter 6.

The CP/M Commands and Utility Programs

The complete set of resident and transient CP/M commands provided on your CP/M installation diskette is summarized in Table 9. The complete set of utility programs provided on your CP/M installation diskette is summarized in Table 10.

NOTE: *CP/M executes any command you give only after you press <RET>.*

Table 9 CP/M Resident and Transient Commands

Command	Function of Command
*ASM	Runs ASM.COM, an assembly program for 8080 microcomputers. This command is described in Chapter 4.
*DDT	Runs DDT.COM, a CP/M program debugging utility. This command is described in Chapter 4.
DIR	Displays a list of the files on a diskette.
*DUMP	Runs DUMP.COM, the CP/M file-examining utility. This command is described in Chapter 4.
*ED	Runs ED.COM, the CP/M text editing program.
ERA	Erases or deletes a file.
*LOAD	Runs LOAD.COM, a program that creates an executable .COM file from a .HEX format file. This command is described in Chapter 4.
*PIP	Runs PIP.COM, the Peripheral Interchange Program, which copies files and transports copies of files from one system device to another.
REN	Renames a file.
SAVE	Saves portions of memory in a diskette file. This command is described in Chapter 4.
*STAT	Runs STAT.COM, a CP/M program that provides information about and certain controls over diskette, hard disk volume, keyboard, and printer allocations.
*SUBMIT	Runs SUBMIT.COM, which permits the execution of a file of previously-generated commands.
TYPE	Displays the contents of a text file on the DECmate II screen.
USER	Permits creation and use of separate diskette areas for multiple users.
*XSUB	Runs XSUB.COM, an extension to SUBMIT.COM. Permits line input to programs invoked by SUBMIT.

Table 10 DECmate II CP/M Utility Programs

Command	Function of Command
BOOT	Runs BOOT.COM, a utility program which cold starts a designated hard disk system volume. This utility can only be used with hard disk systems and is described in Chapter 6.
DISKCOPY	Runs DISKCOPY.COM, a diskette copying utility program. This utility is described in Chapter 5.
DISKINIT	Runs DISKINIT.COM, a diskette initializing utility program. This utility is described in Chapter 5.
DISMOUNT	Runs DISMOUNT.COM, a utility program which dismounts hard disk volumes. This utility can only be used with hard disk systems and is described in Chapter 6.
GREETING	Runs GREETING.COM, a utility program which displays the CP/M startup banner. This utility is described in Chapter 5.
HD	Runs HD.COM (the hard disk utilities program) a collection of support utilities for the RD51 hard disk. This utility can only be used with hard disk systems and is described in Chapter 6.
MOUNT	Runs MOUNT.COM, a utility program which mounts hard disk volumes. This utility can only be used with hard disk systems and is described in Chapter 6.
PRSETUP	Runs PRSETUP.COM, a utility program which sets up DECmate II printer characteristics. This utility is described in Chapter 5.
SETSTART	Runs SETSTART.COM, a utility program which replaces STARTUP.COM (a utility which runs whenever you cold start your DECmate II system). This utility allows you to create self-starting system diskettes. It is described in Chapter 5.
STARTUP	Runs STARTUP.COM, a utility program which runs whenever you start your DECmate II system. This utility is described in Chapter 5.
WPSCONV	Runs WPSCONV.COM, a program which translates both CP/M text files to WPS documents and WPS documents to CP/M text files. This utility is described in Chapter 5.

Detailed information about each of the basic CP/M commands follows. After the discussion of each command is a list of the messages that may be produced by the command in question. These messages do not always identify errors; they sometimes provide routine information about the status of the system. For general information about recovering from errors, see Chapter 2.

The Basic CP/M Commands

DIR

The DIR (directory) command causes the system to list on the screen the names of files on a diskette or volume. This command can be typed alone, or it can be accompanied by file and/or disk drive specifications. Typing the command

```
A> DIR<RET>
```

lists all files on the current diskette or volume and is equivalent to typing the following command:

```
A> DIR *.*<RET>
```

For information about using the *wildcard* specifiers * and ?, see the Using File References section in Chapter 2.

The following DIR commands are valid.

```
A> DIR X.Y<RET>
```

DIR looks for the file X.Y on the current diskette. If the file is on the current diskette, DIR displays the file name, X.Y, on the screen. If the file is not on the current diskette, DIR displays NO FILE.

```
A> DIR X?Z.C?M<RET>
```

DIR looks on the current diskette for all files with a three-letter file name beginning with X, ending with Z, and having any character for the second letter. The file must also have a file type that begins with C, ends with M, and has any character for the second letter. DIR displays a list of all the files fitting this description. If no files are found, DIR displays NO FILE.

```
A> DIR *.COM<RET>
```

DIR looks on the current diskette for all files with the file type .COM. DIR then displays these file names on the screen. If there are no files with the .COM file type on the current diskette, DIR displays NO FILE.

A drive name can precede the file name. The following DIR commands cause CP/M to access the specified drive before the directory search takes place:

```
A> DIR B:<RET>
```

DIR lists all the files on the diskette in drive B.

```
A>DIR C:X.Y<RET>
```

DIR looks on the diskette or volume in drive C for the file X.Y. If DIR finds the file on the diskette or volume, it displays X.Y on the screen. If X.Y is not on the diskette or volume, DIR displays NO FILE.

```
A>DIR B:*.C?M<RET>
```

DIR looks on the diskette in drive B for all files with any file name and a file type beginning with C, having any second letter, and ending with M. DIR displays the names of all files fitting this description. If no files are found, DIR displays NO FILE.

DIR Error Messages.

NO FILE

The specified file(s) could not be found on the selected diskette or hard disk volume. Check the file name(s) and try again.

*ED

The ED command runs ED.COM, a program that allows you to create and modify text files. ED is what is sometimes called a *line-oriented* editor. That is, its primary focus is a single line within the text. If you want information about more than the line you are presently working on, you must issue commands to display the lines above and below your present location. This distinguishes ED from the *screen-oriented* editors usually associated with word processing systems. These editors show you the context in which you are working by automatically displaying a whole screen of up-to-date text each time you change your working location.

If you intend to use your DECmate II system extensively to create and modify large documents, you should use the WPS word processing software that is available for your DECmate II system. If, however, you expect only to create short text files, ED may be adequate for your needs.

NOTE: *The following text provides you with the basic facts about ED. If you have never run this program before, you should follow the sample session on ED in Chapter 2.*

Starting an Editing Session. To run ED, give the ED command, together with an unambiguous file name and file type. For example, to edit the file TEXT.TXT, you would type:

```
A>ED TEST.TXT<RET>
```

If TEST.TXT does not exist, ED opens a file of that name and then displays:

```
NEW FILE
: *
```

If TEST.TXT exists, ED responds:

```
: *
```

You must then append lines from the existing file using the ED A command, which is described below.

In both of the examples above, the asterisk is the ED prompt character and indicates that the program is waiting for a command. At this point you have a variety of options, which are discussed later in this section. First, however, some basic facts.

The Text Buffer vs. the Disk File. When you create a document by typing characters for ED to process, those characters are initially stored in the DECmate II system memory. This allows you to make any necessary changes before ED transfers the file to a diskette or volume. Since memory can be quickly and easily altered, ED puts all the text it can in memory before it requires any transfers to diskette or hard disk volume.

The portion of memory that ED allocates for this temporary storage task is called the text buffer. In the DECmate II system, the ED text buffer can contain about 38,000 characters. (This amounts to about 12 pages of single-spaced text.)

When you invoke ED, it not only opens a text buffer in memory, but also creates two files—in this example, TEST.TXT and TEST.***, both of which are empty. When you end the editing session, ED does the following:

- Renames TEST.TXT to TEST.BAK
- Moves the text from the buffer into TEST.***
- Renames TEST.*** to TEST.TXT

TEST.BAK thus becomes a backup copy containing the previous version of the file. If you have just created a new file and there is no previous version, TEST.BAK is empty. However, when you make future edits, the previous version becomes TEST.BAK, and the new version becomes TEST.TXT.

This feature ensures that you always have the last version, as well as the next-to-the-last version of the file.

Routine Editing Operations. You can do most of your work with ED easily once you are familiar with the following concepts. These concepts are discussed in the remainder of this section:

- The character pointer (CP)
- Commands for getting text into the buffer
- Commands for displaying text
- Commands for deleting text from the buffer
- Commands for moving the character pointer
- Commands for transferring text from the buffer to the file
- Commands for ending an editing session

The Character Pointer (CP). The majority of operations that ED performs on text located in the buffer uses the character pointer, called the CP. The character pointer is an imaginary arrow that marks your place in the buffer. It sits either before the first character, behind the last character, or between two characters in the buffer. You always insert text to the immediate right of the CP, and you display text forward or backward from the CP.

The following tables summarize the ED commands which are available for you to use. In the tables, +/- preceding an ED command indicates that the CP can move forward (+) or backward (-). Or, it refers to text after (+) or before (-) the CP. You do not have to use the + sign; if you do not specify a sign, ED assumes you mean +. Always terminate an ED command by pressing <RET>, the RETURN key.

In the following tables, italic text indicates information that you supply. For example, *n* indicates that you should supply a number, and *string* indicates that you should supply a string of characters.

Moving Text into the Buffer. Table 11 summarizes the commands for moving text into the buffer.

Table 11 ED Commands for Moving Text into the Buffer

Command	Function
<i>n</i> A	Appends <i>n</i> lines of text to the buffer. Moves the <i>n</i> lines of text from the disk file. #A moves a maximum number of 65,535 lines of text or fills the entire text buffer. 0A moves lines of text until the file is totally transferred, or the text buffer is half filled.
I or i	Enters insert mode. Inserts text to the right of the CP in the buffer until you type <CTRL/Z>. <p>If you type I, inserts all text as upper-case. If you type i, inserts text as either upper-case or lower-case, as you enter it.</p> <p>WORD/CHAR (the Rubout key), (BS) (the Backspace key), <CTRL/U>, and <CTRL/X> can all be used to correct errors in ED commands.</p>
I <i>string</i> <CTRL/Z>	Inserts <i>string</i> , a string of characters, to the right of the CP. A RETURN is not appended.
I <i>string</i>	Inserts <i>string</i> , a string of characters, and a RETURN to the right of the CP.

Displaying Text. The ED commands for displaying text in the buffer are discussed in Table 12.

Table 12 ED Commands for Displaying Text

Command	Function
$+/-nT$	Types n lines of text. Displays the n lines of text after the CP if n is positive, or before the CP if n is negative. If the CP is in the middle of a line, 0T displays the text from the beginning of the line to the CP, and T or 1T displays the text from the CP to the end of the line. Thus, 0TT displays the whole line.
$+/-n$	Moves the CP n lines, forward if n is positive or backward if n is negative, and displays that line. The same as entering the following combination of ED commands: $+/-nLT$.
$+/-V$	Controls the form of the ED display. The normal display mode numbers the lines on the screen. These numbers, combined with ED's prompt symbol, take up space on the left side of the screen and prohibit formatting lines longer than 72 columns. Entering -V, however, eliminates line numbering and permits displaying lines of text across the full 80-column width of the screen. Typing V returns to line-numbering mode.

Deleting Text from the Buffer. The ED commands outlined in Table 13 delete text from the buffer.

Table 13 ED Commands for Deleting Text from the Buffer

Command	Function
$+/-nD$	Deletes the n characters after the CP if n is positive, or before the CP if n is negative.
$+/-nK$	Deletes the n lines of text after the CP if n is positive or before the CP if n is negative. If the CP is in the middle of a line, 0K deletes all characters from the beginning of the line to the CP; -1K deletes those characters and all characters on the preceding line. Similarly, K or 1K deletes all characters between the CP and the beginning of the next line (including the RETURN that separates lines).

Moving the Character Pointer. You can move the CP either by issuing commands or by asking ED to find the *n*th occurrence of a character string. These commands are summarized in Table 14.

Table 14 ED Commands for Moving the Character Pointer

Command	Function
+/-B	Moves the CP to the beginning or end of the buffer. Entering B moves the CP to the beginning of the buffer. Entering -B moves the CP to the end of the buffer.
+/-nC	Moves the CP <i>n</i> characters forward if <i>n</i> is positive, or backward if <i>n</i> is negative.
+/-nL	Moves the CP <i>n</i> lines forward if <i>n</i> is positive, or backward if <i>n</i> is negative.
<i>n</i> :	Moves the CP to the beginning of line number <i>n</i> .
: <i>m</i>	Defines the end of a range. For example, :22T types from the present location to the beginning of line 22; 3::25T moves the CP to the beginning of line 3 and types the buffer from that point to the beginning of line 25.
+/-nP	Moves the CP forward if <i>n</i> is positive, or backward if <i>n</i> is negative, <i>n</i> pages. Then it displays each page. If <i>n</i> is 0, it displays the current page.
<i>nFstring</i> <CTRL/Z>	Finds the <i>n</i> th occurrence of <i>string</i> , a string of characters, in the current buffer. Leaves the CP at the end of the string found.
<i>nNstring</i> <CTRL/Z>	Finds the <i>n</i> th occurrence of <i>string</i> , the specified string of characters, even if it is not contained in the current buffer. If <i>string</i> cannot be found in the current buffer, ED writes the buffer to the output file, reads in and searches the next buffer. It does this until <i>string</i> is found, or the end of the file is reached.
<i>nSstring</i> <CTRL/Z> <i>substitute</i> <CTRL/Z>	Finds <i>n</i> occurrences of <i>string</i> , the first string of characters, and replaces each one with <i>substitute</i> , the second string of characters.
<i>nJstring</i> <CTRL/Z> <i>insert</i> <CTRL/Z> <i>terminate</i> <CTRL/Z>	Finds <i>n</i> occurrences of <i>string</i> , the first string of characters and inserts <i>insert</i> , the second string of characters, immediately after <i>string</i> . It then deletes all characters from <i>insert</i> up to (but not including) <i>terminate</i> , the terminate string of characters.

NOTE: Since `<RET>` terminates a search string, you cannot use `<RET>` as a character within a search string. *ED*, however, allows you to symbolize `<RET>` with `<CTRL/L>`. When `<RET>` needs to be part of a search or replacement string, use `<CTRL/L>` to represent it.

Moving Text from the Buffer to the Disk File. The commands for moving text from the buffer to the disk are listed in Table 15.

Table 15 ED Commands for Moving Text from the Buffer to the File

Command	Function
<i>n</i> W	Writes <i>n</i> lines of text from the buffer to the temporary file and deletes those lines from the buffer. It always begins with the first line in the buffer. If <i>n</i> is replaced with the pound sign (#), it writes the entire buffer to the temporary file. If <i>n</i> is zero, writing stops when the buffer is half full.
H	Moves the CP to the head of the temporary file. In so doing, <i>ED</i> , in effect, performs an E command followed by an <i>ED filename</i> command. The result is quick protection against operator error or equipment failure.

Ending an Editing Session. There are several commands available for ending editing sessions. These commands are outlined in Table 16.

Table 16 ED Commands for Ending Editing Sessions

Commands	Function
E	Ends the current editing session; copies the buffer and all remaining source file data to the temporary disk file; and changes the temporary disk file extension to that of the original source disk file. Returns the user to the CP/M prompt.
O	Omits any edits made during the current editing session and returns the source file to its unedited state. <i>ED</i> asks O-(Y/N)? before it proceeds, since this command discards all changes made during the current session.
Q	Quits the editing session. Leaves the source file unchanged and deletes the temporary disk file. <i>Ed</i> asks Q-(Y/N)? before it proceeds, since this command discards all changes made during the current session.

Advanced Editing Operations. The ED commands listed in Table 17 are somewhat more complex and specialized than the routine commands covered above. You can work without most of them, although they are occasionally very useful.

Table 17 ED Commands for Advanced Editing Operations

Command	Function
<i>nMstring of ED commands</i> <CTRL/Z>	If <i>n</i> is greater than one, executes the <i>string of ED commands n</i> times. If <i>n</i> is zero or one, executes the <i>string of ED commands</i> until an error occurs.
<i>nX</i>	Transfers a block of text (the <i>n</i> lines following the CP) to a temporary file (X\$\$\$\$\$.LIB) called the block move file. If that file has been previously written into during the current session, the present block will be added to the file. Since you can read from this file (with the R command), this procedure allows you to move lengthy text passages from one place to another.
R	Reads the block move file (see the X command, above) into the buffer to the left of the CP.
<i>Rfilename</i>	Reads a previously-created file named <i>filename</i> .LIB into the buffer to the left of the CP. If you have boilerplate text that you routinely repeat, this command lets you create it once and access it when needed. The .LIB files can be created with ED just like any others.
+/-U	U Changes all lower-case alphabetic input (from the keyboard or the source file) to upper-case. -U stops the change of case.
0V	Displays two numbers. The first is the number of free bytes left in the buffer, and the second is the total size of the buffer.

ED Error Messages.

**** FILE IS READ/ONLY ****

This message is presented as you enter ED and warns you that although you can read the named file, it has been set (by STAT) to Read/Only status. You cannot edit this file until you terminate the ED command and use the STAT command to change the file access attribute from Read/Only to Read/Write.

'SYSTEM' FILE NOT ACCESSIBLE

This file has the SYStem file attribute. The editing session automatically ends. You cannot edit this file unless you first use the STAT command to change the SYStem file attribute.

NO INPUT FILE PRESENT ON DISK

You made a typing error, named a nonexistent file, or omitted a required drive name.

BDOS ERROR ON d: BAD SECTOR

CP/M displays this message when it detects a disk error. If you ignore the message and press <RET>, you should examine the text in the buffer to see if it was correctly read. Alternately, you can warm start the system (press <CTRL/C>) and reclaim the backup file if it exists. To reclaim the backup file, first type the backup file (file type .BAK) to see that it contains the correct information. Then erase the damaged file (the source file).

Finally, rename the backup file as the source file and edit this file. You will be editing the previous version of the file. Consequently, you lost all the edits you made during the editing session that you ended with a <CTRL/C>, but you did not lose the entire file.

BREAK X AT Y

When ED detects an error condition, it displays the message shown above. Y represents the ED command that was executing when the error condition occurred. X represents one of the following error codes:

- ? ED does not recognize the command you entered.
- > The memory buffer is full. Or, with the F, N, or S commands, the character string is too long.
- # ED cannot execute the command as many times as you requested. This message appears frequently and usually indicates that ED has finished executing.
- O ED cannot open the .LIB file. Occurs when you issue the R command and use an incorrect .LIB file name.

ERA

The ERA (erase) command erases files from a disk and frees up space so you can use it again. The examples below show several different cases of legal ERA commands. (For information about the use of the wildcard specifiers, * and ?, see the Using File References section, in Chapter 2.)

CAUTION: *Use the ERA command only with the names of files you want to erase. Be especially careful when you use an ambiguous file reference; you could unintentionally erase many files.*

The following examples illustrate the use of the ERA command. Do not type these commands unless you are using the names of files you want to erase.

```
A>ERA X.Y<RET>
```

Erases the file X.Y from the diskette in the current drive.

```
A>ERA X.*<RET>
```

Erases all files with the file name X from the diskette in the current drive.

```
A>ERA *.BAK<RET>
```

Erases all files with the file type .BAK from the diskette in the current drive.

```
A>ERA *.*<RET>
```

Erases all files on the current disk. Because this is a drastic action, CP/M always gives you a chance to reconsider by prompting you with the message:

```
ALL (Y/N)?
```

Type **N** and press <RET>, unless you want to erase all the files on the current diskette or volume.

```
A>ERA B:*.BAK<RET>
```

Erases all files with the file type .BAK from the diskette in drive B, regardless of which drive is the current drive.

ERA Error Messages.

NO FILE

The specified file(s) could not be found on the disk you selected. Check the file name and try again.

*PIP

The PIP command invokes PIP.COM, the CP/M Peripheral Interchange Program. You use PIP for copying files and transferring copies of files from one system device to another. PIP allows you to transfer files between diskettes and volumes, to output files on printers and other devices connected to the serial ports on the rear of your DECmate II system—and even to create files directly from the keyboard.

PIP can be invoked in two ways:

- In *command mode*, for simple transfers that can be specified on one line, and
- In *program mode*, for more complex transfer operations.

These two modes are described in the following text.

CAUTION: *PIP copies to the file name you specify on the destination diskette or volume. If a file with the same name already exists on that diskette or volume, CP/M replaces it with the new file WITHOUT COMMENT.*

Command Mode. In command mode you type PIP, then a space, the name of the destination file, an equal sign (=), and finally the name of the source file. Then press <RET>. For example:

```
A>PIP ABC.NEW=XYZ.OLD<RET>
```

PIP makes a copy of file XYZ.OLD and gives it the name ABC.NEW. Both files are on the current diskette or volume. XYZ.OLD is unaffected by the copy operation.

```
A>PIP ABC.NEW=B:XYZ.OLD<RET>
```

XYZ.OLD resides on the diskette or volume in drive B. PIP makes a copy of it on the current diskette or volume and gives it the name ABC.NEW.

Note that ambiguous file references are acceptable to PIP. (For information about the use of the wildcard specifiers * and ?, see the Using File References section in Chapter 2.)

```
A> PIP E:=B:*.COM<RET>
```

PIP copies all files with a file type .COM from the diskette in drive B to the CP/M volume mounted on drive E.

You can transfer copies of files from a file on a diskette or volume to an external device.

```
A> PIP LST:=TEXT.TXT<RET>
```

PIP copies the file TEXT.TXT to the current list device. If this is a printer, PIP causes the file to be printed.

Note that typing PIP CON:=TEXT.TXT is equivalent to typing TYPE TEXT.TXT because CON: is the logical device name for the screen.

Program Mode. Execute PIP in program mode by typing PIP<RET>. When you do this, PIP.COM is loaded into the DECmate II system memory and started. PIP displays an asterisk (*), then waits for you to specify a transfer operation and press <RET>. If you press <RET> following an input line of one or fewer characters, PIP terminates and returns you to the CP/M prompt.

The following example illustrates the use of the PIP command in program mode.

```
A> PIP<RET>
* B:TEX3.TXT=A:TEX1.TXT,A:TEX2.TXT<RET>
* <RET>
A>
```

The first line calls and runs PIP.COM. PIP displays its prompt (the asterisk) at the beginning of the second line. The PIP commands following the asterisk merge copies of the files TEX1.TXT and TEX2.TXT (on the diskette in drive A:) into the file TEX3.TXT (on the diskette in drive B:). PIP returns its prompt. The user exits PIP by pressing <RET>.

Note that PIP allows the mixing of drives in one transfer specification and also allows multiple source files to be merged into one destination file. PIP scans the source file specifications from left to right and transfers them to the destination file in the order in which they are encountered.

PIP Parameters. PIP allows you to modify the behavior of a transfer operation by including any of several symbols, called *parameters*. PIP parameters are single characters (or single characters followed by arguments) that are inserted between square brackets ([]) at the end of the transfer command as shown below.

```
A>PIP B:=A:TEXT.TXT[EV]<RET>
```

This example copies the file TEXT.TXT from the diskette in the current drive to the diskette in drive B. While copying, PIP types the file on the display screen and verifies that the file is being copied correctly.

You can combine several parameters in one set of brackets with no punctuation marks or spaces between them.

When a PIP command line contains one or more parameters, its normal behavior is modified as indicated in Table 19.

In Table 18, *italic text* indicates information that you supply. For example, *n* indicates that you should supply a number, and *string* indicates that you should supply a string of characters.

Table 18 PIP Parameters

Parameter	Effect
B	Performs a block mode transfer. PIP copies data to a buffer until a <CTRL/S> character is received. PIP then copies that data from the buffer to a file and then copies more data to the buffer. (This allows you to copy data to a file from a continuous reading device, such as a cassette reader.)
D <i>n</i>	Deletes characters that extend past column <i>n</i> (counted from the last RETURN or LINE FEED) as the characters are transmitted to the destination. You can use this parameter to truncate long lines being sent to a narrow printer or console device.
E	Echoes all transfer operations to the screen as they are being performed. (This is clearly a useful option only when text files are being transferred.)

Table 18 PIP Parameters (cont.)

Parameter	Effect
F	Removes form feeds (page breaks) from the file. (The P parameter can be used simultaneously to insert new page breaks with a different number of lines per page.)
Gn	Gets the file from user area <i>n</i> .
H	Checks data as transferred for proper Intel hexadecimal file format.
I	Sets the H parameter and ignores ":00" records.
L	Translates upper-case characters to lower-case.
N	Adds line numbers to each line transferred to the destination, starting at 1 and incrementing by 1. Leading zeroes are left out, and the number is followed by a colon. If you specify N2, leading zeroes are included, and a tab is inserted following the number. (If T is set, the tab is expanded according to its specification.)
O	Transfers an object file (that is, a nontext file). This is necessary when transferring program or binary data (but not .COM) files. Sometimes, data in an object file looks like the code for <CTRL/Z>. The O parameter keeps PIP from stopping when it reads such a false <CTRL/Z>.
Pn	Inserts form feeds (page breaks) after every <i>n</i> lines (with an initial page eject). If <i>n</i> = 1 or <i>n</i> is omitted, form feeds occur every 60 lines. (If the F parameter is also invoked, form feed suppression occurs before the new form feeds are inserted.)
Qstring <CTRL/Z>	<p>Quits copying from the source device or file when <i>string</i>, a string of characters, is encountered. Allows partial files to be copied. (Can be used with the S parameter to define a file segment that begins after the beginning of the source file and terminates before the end of the source file.)</p> <p>Note that PIP must be entered in program mode if you want to match lower-case strings.</p>
R	Copies (reads) system (\$SYS) files.
Sstring <CTRL/Z>	<p>Starts copying from the source device when <i>string</i>, a string of characters, is encountered. (Can be used with the Q parameter to define a file segment that begins after the beginning of the source file and terminates before the end of the source file.)</p> <p>PIP must be entered in program mode if you want to match lower-case character strings.</p>

(continued)

Table 18 PIP Parameters (cont.)

Parameter	Effect
T n	Expand tabs to every n th column during the transfer of characters to the destination.
U	Translate lower-case alphabetic characters to upper-case during the transfer operation.
V	Verifies that data has been copied correctly by rereading after the write operation (works only when the destination is a disk file).
W	Overwrites a Read/Only file without displaying a message on the screen.
Z	Sets the parity bit to zero.

The following are valid PIP commands that specify parameters in the file transfer:

```
A>PIP B:DATA.MAY=A:DATA.APR[V]<RET>
```

This PIP command transfers a copy of the file DATA.APR from the diskette in drive A: to the diskette in drive B: and verifies that the transfer is correct.

```
A>PIP LST:=DATA.MAY[NTBU]<RET>
```

This PIP command transfers a copy of DATA.MAY to LST:, the list device. While doing so, it numbers each line, expands tabs to every eighth column, and translates lower-case letters to upper-case.

PIP Error Messages.

```
CANNOT CLOSE DESTINATION FILE:  =n:filename.typ
```

PIP cannot close an output file. Press <CTRL/C> and start over. Check to see that the correct diskette or volume is in the destination drive. And, if you are using a diskette, make sure it is not write-protected. Then, re-enter the PIP command.

```
DESTINATION IS R/O, DELETE (Y/N)?
```


You tried to write to a Read/Only file. When files are not write-protected, PIP overwrites any file with the same name as the name you specify for the destination file without comment. If you respond **N** to the above message, PIP replies ****NOT DELETED**** and cancels the transfer. If you respond **Y**, PIP deletes the file and completes the transfer.

NO FILE: =filename.typ

Occurs if the specified source file cannot be found on the specified disk.

QUIT NOT FOUND: =n:filename.typ[Qstring]

Occurs when the **Q** parameter has been specified and *string*, the string of characters specifying the quitting point, could not be found.

START NOT FOUND: =n:filename.typ[Sstring]

Occurs when the **S** parameter has been specified and *string*, the string of characters specifying the starting point, could not be found.

REN

The **REN** (rename) command lets you change unambiguous file names and types. The command form is: **REN NEWNAME = OLDNAME**, where **NEWNAME** and **OLDNAME** are unambiguous and may contain drive as well as file specifications.

The following example changes the file name **REPORT.JAN** to **COSTS.JAN**:

```
A>REN COSTS.JAN=REPORT.JAN<RET>
```

You can precede either or both file names with a drive name. To do so, follow these rules:

- If you specify a drive name for either file name in the command line, then CP/M assumes the other file is on the same disk.
- If you specify a drive name for both files, you must specify the same drive name in both cases.

The following example changes the name **REPORT.JAN** to **COSTS.JAN** on the diskette in drive **B**:

```
A>REN B:COSTS.JAN=REPORTS.JAN<RET>
```

The next example also changes the name REPORTS.JAN to COSTS.JAN on drive B:

```
A>REN B:COSTS.JAN=B:COSTS.JAN<RET>
```

REN Error Messages.

NO FILE

The specified file(s) could not be found on the selected diskette or volume. Check the file name and try again.

FILE EXISTS

You specified an existing file name as the new name for a file. When this happens, the system issues the above message and cancels the rename operation.

filename.typ?

You specified different drives on the two sides of the rename equation.

*STAT

The STAT command displays statistics for and permits certain controls over diskette and volume files and system devices.

Statistics on Files. STAT commands perform all of the following operations on files:

- Display the amount of free space (in bytes) and the attributes of all diskettes or volumes accessed since the last system warm start
- Display the amount of free space for a specified diskette or volume
- Display the size and attributes of a single file or a group of files
- Assign file access and directory attributes to a single file or a group of files
- Assign physical devices to logical device names

File Access Attributes. A file with the R/O (Read/Only) attribute can be accessed only for reading. It cannot be changed or erased.

A file with the R/W (Read/Write) attribute can be read, changed, and erased. R/W is the normal (default) attribute.

A file with the SYS (System) attribute will not be listed in a DIR command nor will it be copied by a PIP command. The SYS attribute is removed by assigning the DIR (Directory) attribute to the file.

The STAT terms are defined in Table 19.

Table 19 STAT Command Terms

Term	Meaning
Recs	(Records) 128-byte units by which CP/M stores data.
Bytes	(Bytes) Basic storage unit (8 bits).
Ext	(Extents) Storage units (physical extents) which CP/M allocates to a file.
Acc	(File Access Attribute) R/W (Read/write); R/O (Read/only) SYS (System); DIR (Directory)
K	(kilo-) 1024 bytes

Examples Using STAT on Files. Display the access attributes and amount of free space (in bytes) on the diskettes or volumes in all drives accessed since the last system start by typing:

```
A> STAT<RET>
```

STAT displays:

```
A:  R/W, Space:  54k
B:  R/O, Space: 128k
```

All the following examples access drive A. However, you can use the commands to access any drive on your system that contains a diskette or volume.

To display the amount of free space (in bytes) for the diskette in drive A, type:

```
A> STAT A:<RET>
```

STAT displays:

```
Bytes Remaining on A: 100K
```

To display the amount of space (in records, bytes, and extents) occupied by the file TEST.TXT, type:

```
A>STAT A:TEST.TXT<RET>
```

STAT displays:

```
Recs  Bytes  Ext  Acc  
  24    3K    1  R/W A:TEST.TXT  
Bytes Remaining on A: 100K
```

To display the amount of space occupied by each file with the file type .TXT, type:

```
A>STAT A:*.TXT<RET>
```

STAT displays:

```
Recs  Bytes  Ext  Acc  
   4     2K    1  R/W A:DEC.TXT  
  10     2K    1  R/O A:JAN.TXT  
  24     3K    1  R/W (A:NEXT.TXT)  
  12     2K    1  R/W A:TEST.TXT  
Bytes Remaining on A: 100K
```

The parentheses around NEXT.TXT indicate that the file has the System attribute. Also notice that STAT lists the filenames in alphabetical order.

To assign the attribute R/O to TEST.TXT, type:

```
A>STAT A:TEST.TXT $R/O<RET>
```

STAT displays:

```
TEST.TXT SET TO R/O
```

TEST.TXT is now set to Read/Only. It can be read, but not erased or written into. This protection remains until you change it again with STAT.

To assign the attribute R/W to TEST.TXT, type:

```
A>STAT A:TEST.TXT $R/W<RET>
```

STAT replies:

```
TEST.TXT SET TO R/W
```

TEST.TXT can now be both read from and written to.

Attributes can be assigned to groups of files with wild cards (* and ?). For example, typing:

```
A>STAT B:*. * $R/O<RET>
```

sets all files on diskette B: to Read/Only.

STAT File Error Messages.

File Not Found

You specified a nonexistent file or the wrong drive name, made a typing error, or forgot to follow the drive name with a colon.

Invalid File Indicator

You tried to set files to something other than R/W, R/O, SYS, or DIR.

Statistics on Devices. The DECmate II system routinely communicates with three kinds of physical devices:

- The display screen
- The keyboard
- The diskette or volume drives

In addition, the system can communicate with devices that you connect to it, such as printers, modems, and measurement instruments. When the DECmate II system communicates with these additional devices, CP/M needs two names for each one: a physical device name and a logical device name.

A logical device name identifies one of only four generic functions. The STAT logical device names are listed in Table 20.

Table 20 Stat Logical Device Names

Abbreviation	Meaning
CON:	This is the user console device. It interacts with CP/M, accepting input from a keyboard and displaying output on a video screen or paper.
RDR:	This device receives information (input only).
PUN:	This device sends information (output only).
LST:	This device lists information (output only).

Each logical device name can be associated (by means of STAT) with any one of several physical devices. CP/M allows 11 physical devices, of which the DECmate II system can use four at a time. This group is listed in Table 21.

Table 21 STAT Physical Device Names

Abbreviation	Meaning
TTY:	Communications port, input and output
CRT:	Keyboard input, screen output
UC1:	Printer port, input and output
PTR:	Printer port, input only
PTP:	Printer port, output only
UR1:	Keyboard input
UR2:	Dummy input (always gives end-of-file character)
UP1:	Screen output
UP2:	Dummy output (output to this device is ignored)
LPT:	Printer port, output only
UL1:	Dummy output (output to this device is ignored)

You must assign each physical device in your DECmate II system to an appropriate logical device. CP/M allows the physical-to-logical device assignments listed in Table 22.

Table 22 Valid Physical-to-logical Device Assignments

Logical Device	Physical Devices
CON:	TTY:, CRT: , BAT:, UC1:
RDR:	TTY: , PTR:, UR1:, UR2:
PUN:	TTY: , PTP:, UP1:, UP2:
LST:	TTY:, CRT:, LPT: , UL1:

The physical devices listed in **bold** print are the default devices, the devices that CP/M uses when you first start the system.

Note that BAT: is a pseudo-physical device. It stands for *batch processor*. If you assign BAT: to be the console device, CON:, then input comes from the current RDR: device, and output goes to the current LST: device.

STAT commands perform the following operations on physical and logical devices:

- Display the current physical devices and their connections to logical devices
- Display the possible physical-to-logical device assignments
- Assign physical devices to logical devices
- Display current diskette attributes

Examples Using STAT on Devices. To display the current physical-to-logical assignments, type:

```
A> STAT DEV:<RET>
```

STAT replies:

```
CON: is CRT:
RDR: is UR1:
PUN: is UP1:
LST: is LPT:
```

To display the possible physical-to-logical device assignments, type:

```
A>STAT VAL:<RET>
```

STAT replies with the following message:

```
Temp R/O Diskette: X:=R/O
Set Indicator: X:filename.type $R/O $R/W $SYS $DIR
Diskette Status : DSK: X:DSK:
User Status : USR:
Iobyte Assign:
CON: = TTY: CRT: BAT: UC1:
RDR: = TTY: PTR: UR1: UR2:
PUN: = TTY: PTP: UP1: UP2:
LST: = TTY: CRT: LPT: UL1:
```

This message means:

- To create a temporary read-only drive, type:

```
A>STAT X:=R/O<RET>
```

where X = drive name.

- To change the attributes of a file or files, type:

```
A>STAT X:filename.type $atr<RET>
```

where *atr* is one of the attributes R/O, R/W, SYS, or DIR and X is the drive name.

- To see the storage characteristics of drive X, type;

```
A>STAT X:DSK:<RET>
```

where X is the name of the drive in question; STAT DSK:<RET> requests characteristics of all drives accessed since the last system warm start.

- To see the current user status, type:

```
A>STAT USR:<RET>
```

- IOBYTE ASSIGN: introduces a list of possible physical to logical device assignments.

To assign the physical device TTY: to the logical device CON:, type:

```
A>STAT CON:=TTY:<RET>
```

To assign the physical device CRT: to the logical device LST:, and the physical device TTY: to the logical device RDR:, type:

```
A>STAT LST:=CRT:,RDR:=TTY:<RET>
```

The following two examples access drive A. However, you can use the commands to access any drive in your system that contains a diskette or volume.

To display the characteristics of the diskette in drive A, type:

```
A>STAT A:DSK:<RET>
```

STAT displays:

```
A: Drive Characteristics
3120: 128 Byte Record Capacity
390: Kilobyte Drive Capacity
128: 32 Byte Directory Entries
128: Checked Directory Entries
256: Records/Extent
16: Records/ Block
40: Sectors/ Track
2: Reserved Tracks
```

To assign a temporary Read/Only status to the diskette in drive A, type:

```
A>STAT A:=R/O<RET>
```

STAT Device Error Messages.

File Not Found

The named file could not be found on the named diskette.

INVALID DISK SELECT - CONTROL-C TO RE-BOOT

You specified a drive letter other than one of the letters A through H. Type <CTRL/C> to restart.

RESTORE ERROR - DRIVE X

You specified a legal but nonexistent drive name (for example, C or D on a two-drive system).

*SUBMIT

The SUBMIT command runs SUBMIT.COM, which lets you conveniently execute a sequence of CP/M commands. Before using SUBMIT, use ED to create a file which contains the sequence of CP/M commands to execute. When you invoke SUBMIT, it looks for the file containing the CP/M commands. SUBMIT then copies this file, calls the new file \$\$\$SUB, and executes the commands in \$\$\$SUB one at a time.

Example Using SUBMIT. First use ED to create the file SHOW.SUB, containing the following CP/M commands:

```
DIR *.BAK
ERA *.BAK
DIR *.BAK
```

Now type SUBMIT SHOW. SUBMIT creates a new file called \$\$\$SUB, which contains the three commands in SHOW.

The \$\$\$SUB file is always created on the diskette or volume in the drive that the system was started from. That is, drive A for a system operating from a system diskette or drive E for a system operating from a system volume.

```
A>SUBMIT SHOW<RET>
A>DIR *.BAK
A:  filename1 BAK
A:  filename2 BAK
A:  filenamen BAK
A>ERA *.BAK
A>DIR *.BAK
NO FILE
A>
```

SUBMIT Error Message.

Error on Line nnn No 'SUB' File Present

You did not create or give a SUB extension to the named SUBMIT file.

TYPE

The TYPE command displays the contents of a text file on the current console device, usually the display screen.

If you want to terminate a long TYPE display, press any key. This displays the CP/M prompt. If you want to temporarily stop a TYPE display, press the HOLD SCREEN key. Press the HOLD SCREEN key again to restart the display.

The basic form of the TYPE command is:

```
A> TYPE X.Y<RET>
```

X and Y represent an unambiguous file name and file type.

You can also specify a drive name if the file you want to see is not on the current diskette or volume. To do this, type:

```
A> TYPE B:X.Y<RET>
```

TYPE Error Messages.

```
filename?      or      n:filename?
```

The system cannot find the file you specified. You mistyped the file name, used an ambiguous file name, or specified the wrong drive.

*XSUB

Runs XSUB.COM, a program which extends the power of the SUBMIT command by allowing most programs to accept line input from within the SUBMIT file.

When you use the XSUB command in a SUBMIT file, XSUB must be the first command in the SUBMIT file. XSUB then processes the remaining commands in the file and answers program requests for input from the keyboard by reading from the command file.

Example Using XSUB. Use ED to create the SUBMIT file, SAVER.SUB, containing the following CP/M commands:

```
XSUB  
DDT  
PIP.COM  
R  
L  
L  
G0
```

Now issue the SUBMIT command, type:

```
A>SUBMIT SAVER
```

The XSUB program loads, followed by DDT, which loads and prepares to test PIP.COM. R reads PIP.COM. Each L lists twelve lines of PIP.COM. G0 goes to location 0, which returns control to CP/M and displays the CP/M prompt.

4

Commands for Advanced CP/M Users

This chapter discusses the CP/M commands associated with assembly language programming and debugging. These commands are primarily of interest to programmers and advanced CP/M users. The descriptions provided here are brief and are intended to provide only the correct formats for issuing these commands and basic instructions for using them.

ASM

The ASM command reads an assembly language source file from diskette or hard disk volume and produces an 8080 machine language program in Intel hexadecimal format.

Run the CP/M assembler by typing ASM followed by an unambiguous file name. ASM assumes that this file name identifies an 8080 assembly language file which has the file type .ASM. A sample assembly language program, DUMP.ASM, is included on the CP/M installation diskette.

The assembler prints the following message:

```
CP/M ASSEMBLER VER 2.2
```

It then reads the source file and creates two output files with file types .HEX and .PRN. The output file with the .HEX file type is an 8080 machine language program in Intel hexadecimal format. It is suitable for loading with the LOAD command and subsequent execution. The output file with the .PRN file type contains a listing of the original source program, the machine code generated for each statement, and error messages, if any. This file can be listed on the screen with the TYPE command or transferred to a peripheral device with the PIP command.

Example using ASM

To assemble TEST.ASM (an assembly language program on the current diskette or volume) and produce TEST.PRN and TEST.HEX on the current diskette or volume, type:

```
A>ASM TEST<RET>
```

DDT

The DDT command allows you to test, debug, and alter programs. If you have added options to your DECmate II system, for instance, you may need to alter or "patch" applications programs so that they will run on your system. You can do this using the DDT command.

Run the CP/M debugger by giving the DDT command followed by an unambiguous file name. DDT prints the following message:

```
DDT VER 2.2
NEXT PC
xxxx yyyy
-
```

where xxxx (under NEXT) is the memory address following the address of the last program line and yyyy (under PC) is the program counter. The hyphen character on the fourth line is the DDT prompt. DDT is now ready to accept command input.

If you want to test or debug a program, refer to the Digital Research documentation for a list of the DDT commands and instructions for using them. If you are altering a program, follow the alteration instructions provided with the program.

You can terminate DDT at any time and return to the CP/M monitor by entering either <CTRL/C> or G0<RET>. When you exit DDT, the file you were altering remains in memory. Use the SAVE command if you want to keep a copy of the altered file.

DUMP

The DUMP command types the contents of a file on the display screen in hexadecimal format. DUMP lists the absolute byte address on the left side of the screen followed by the file contents, 16 bytes at a time.

Run DUMP by typing DUMP followed by an unambiguous file name.

If you want to terminate a long DUMP display, press any key. This displays the CP/M prompt. If you want to temporarily stop a DUMP display, press the HOLD SCREEN key. Press the HOLD SCREEN key again to restart the display.

LOAD

The LOAD command reads a hexadecimal format, machine language file (with a .HEX file type) and produces an executable file with the file type .COM.

The file you want to load must be a valid Intel hexadecimal format, machine language file and have the file type .HEX, as produced by the ASM command. The file you create will be a .COM file that you can execute at any time by typing the file name and pressing <RET>. You need only load a file once, but you can execute the file any number of times.

Run LOAD by typing LOAD followed by an unambiguous file name.

Example Using LOAD

To load GAMMA.HEX, a hexadecimal format file on the current diskette or hard disk volume, and create GAMMA.COM, an executable COM type file, type:

```
A>LOAD GAMMA<RET>
```

SAVE

The SAVE command saves portions of memory in a file on diskette or hard disk.

Run SAVE by giving the SAVE command followed by an integer and an unambiguous file name. The integer is the decimal number of pages (256-byte blocks) of memory you want to save. The unambiguous file name is the name of the file that will contain the saved memory blocks. The saved file can be loaded and executed later.

Example Using SAVE

To save 3 pages of memory in the file named XYZ on the current diskette, type:

```
A> SAVE 3 XYZ
```

USER

The USER command allows you to create up to 16 separate logical areas (numbered 0 to 15) on a diskette or volume. User area 0 will always be active when you cold start your DECmate II system. You can change to another user area by typing:

```
A> USER n
```

where n is an integer between 0 and 15. When a user area is active, you can access or save files in that area.

The active user area remains the same until you change it or perform a cold start.

5

Utility Programs for all DECmate II Systems

This chapter contains information on the CP/M utility programs which run on all DECmate II systems. Each utility program description is followed by a list of the error messages that may occur while you are using the command. Each error message is explained and the action you should take is discussed.

DISKCOPY

The DISKCOPY command runs DISKCOPY.COM, a utility program that copies, compares, or verifies diskettes. Run this program by first typing DISKCOPY and pressing <RET>. You can then remove the system diskette if you need to use its drive.

DISKCOPY makes a literal copy of the contents of one RX50 diskette onto another RX50 diskette, or one RX01 diskette onto another RX01 diskette.

DISKCOPY cannot copy RX180 diskettes. Also, DISKCOPY cannot copy hard disk volumes. Use the HD utility program Backup option to create copies of hard disk volumes. This utility program is discussed in Chapter 6 of this manual.

DISKCOPY compares the contents of any two diskettes, so long as they are the same kind.

DISKCOPY verifies the readability of any RX50, RX01, or RX180 diskette.

Run this program by typing:

```
A>DISKCOPY<RET>
```

The system displays a menu and asks you:

```
Perform what function [C,M,V,X]?
```

Select C to copy a diskette, select M to compare diskettes, select V to verify a diskette, or select X to leave DISKCOPY.

Copying Diskettes

When you type C and press <RET>, the system responds with the following message:

```
WARNING: Destroys all existing data on the TO disk
```

```
Copy FROM which drive [A..H]?
```

Type the letter of the drive that holds the diskette you want to copy. Then press <RET>. The system asks:

```
TO which drive?
```

Type the letter of the drive that holds the diskette you want to receive the copy and press <RET>. *This diskette loses its original data when you copy the first diskette onto it.* The system displays:

```
Insert disk(s) and Press RETURN when ready (or ESC to re-select)
```

Make sure you have the right diskettes in the appropriate drives. Then press <RET>. A new line appears on the screen:

```
Track nn: Read Write Verify Compare
```

The last four words appear one after the other, very rapidly, and the space marked *nn* shows an incrementing number from 0 to 79 (if the diskettes are RX50) or 0 to 76 (if the diskettes are RX01). After *nn* reaches 79 (or 76), the system displays:

Function completed

Perform another function [Y/N]?

If you now want to copy, compare, or verify any more diskettes, type **Y** and press **<RET>**. If you are done with DISKCOPY, type **N** and press **<RET>**. If you are running CP/M from a CP/M system diskette, follow the directions the system displays:

Be sure that the system disk is in drive A, then press RETURN

If you are running CP/M from a CP/M system volume, you will see the CP/M prompt.

Comparing Diskettes

When you type **M** and press **<RET>**, the system displays the COMPARE notice, then asks you:

Compare FROM which drive [A..H]?

Type the letter of the drive that will hold the diskette you want to use as the basis of comparison. Then press **<RET>**. The system displays:

TO which drive?

Type the letter of the drive that will hold the diskette you want to compare with the first diskette. Then press **<RET>**. The system displays:

Insert disk(s) and press RETURN when ready (or ESC to re-select)

Make sure you have the right diskettes in the appropriate drives. Then press **<RET>**. A new line appears on the screen:

Track nn: Read Verify Compare

The last three words appear one after the other, very rapidly, and the space marked *nn* shows an incrementing number from 0 to 79 (if the diskettes are X50) or 0 to 76 (if the diskettes are RX01) or 0 to 39 (if the diskettes are RX180). If the two diskettes match, the system displays:

```
Function completed
```

```
Perform another function [Y/N]?
```

If the two diskettes do not match, the system stops at the first track that did not match and displays:

```
Error--data read back does not match original data
```

```
Function NOT COMPLETED
```

```
Perform another function [Y/N]?
```

If you want to copy, compare, or verify any more diskettes, type **Y** and press **<RET>**. If you are done with DISKCOPY, type **N** and press **<RET>**. If you are running CP/M from a CP/M system diskette, follow the directions the system displays:

```
Be sure that the system disk is in drive A, then press RETURN
```

If you are running CP/M from a CP/M system volume, you will see the CP/M prompt.

Verifying a Diskette

When you type **V** and press **<RET>**, the system displays the VERIFY notice, then asks you:

```
Verify FROM which drive [A..H]?
```

Type the letter of the drive that holds the diskette you want to verify. Then press **<RET>**. The system displays:

```
Insert disk(s) and Press RETURN when ready
```

Make sure you have the right diskette in the appropriate drive. Then press **<RET>**. A new line appears on the screen:

```
Track nn: Read
```


The space marked *nn* shows an incrementing number from 0 to 79 (if the diskette is RX50) or 0 to 76 (if the diskette is RX180). If the diskette is readable, the system displays:

Function completed

Perform another function [Y/N]?

If the diskette is not readable, the system stops at the first track it could not read and displays:

DISK ERROR--drive X, track nn, sector nn, code nnn

ERROR--disk I/O failed

Function NOT COMPLETED

Perform another function [Y/N]?

If you want to copy, compare, or verify any more diskettes, type **Y** and press **<RET>**. If you are done with DISKCOPY, type **N** and press **<RET>**. If you are running CP/M from a CP/M system diskette, follow the directions the system displays:

Be sure that the system disk is in drive A, then Press RETURN

If you are running CP/M from a CP/M system volume, you will see the CP/M prompt.

DISKCOPY Error Messages

ERROR--drive X not ready (or not installed)

You have not installed a diskette in the named drive (drive X), or you gave the name of an uninstalled drive, or you have not closed the drive door. Correct the problem. Type **Y** and press **<RET>** to start over.

ERROR--FROM and TO disks are of different types

You told DISKCOPY to copy from one diskette to another, but the two diskettes are not both RX50s or RX01s. Change the TO diskette to match the FROM diskette. Type **Y** and press **<RET>** to start over.

ERROR--cannot copy to this disk type

You told DISKCOPY to copy to a diskette which is not in RX50 or RX01 format. Correct the problem. Type **Y** and press **<RET>** to start over.

```
ERROR--data read back does not match original data
```

You told DISKCOPY to copy a diskette, or to compare one diskette with another, and DISKCOPY has found that the two diskettes are *not* the same. Type **N** and press **<RET>** to leave DISKCOPY, or type **Y** and press **<RET>** to use DISKCOPY for another job.

```
DISK ERROR--drive X, track nn, sector nn, code nnn  
ERROR--disk I/O failed
```

DISKCOPY has found that the diskette is unreadable. Type **N** and press **<RET>** to leave DISKCOPY, or type **Y** and press **<RET>** to use DISKCOPY for another job.

```
ERROR--drive X is not a diskette
```

DISKCOPY has found that a drive you named (drive X) is a hard disk drive. It contains a hard disk volume not a diskette and you cannot use DISKCOPY with hard disk volumes. Type **N** and press **<RET>** to leave DISKCOPY, or type **Y** and press **<RET>** to use DISKCOPY for another job.

DISKINIT

The DISKINIT command runs DISKINIT.COM, a utility program that prepares RX50 and RX01 diskettes for use by CP/M. This process is called *initializing*. Run this program by typing:

```
A>DISKINIT<RET>
```

The system responds with the following message:

```
WARNING: Destroys all existing data on the initialized disk
```

```
Initialize disk in which drive [A..H]?
```

Type the letter of the drive that will hold the diskette you want to initialize. Then press **<RET>**. The system displays:

```
Insert disk to be initialized in drive X and press RETURN
```

X stands for the name of the drive you selected. Make sure you have the right diskettes in the appropriate drive. Then press **<RET>**. The system announces that it is writing the diskette directory. If you are initializing an RX50 diskette (RX01 diskettes cannot be used as system diskettes), the system asks:

Is this to be a CP/M SYSTEM or DATA disk [S/D]?

If you want to create a data diskette, type **D** and press **<RET>**. The system displays:

```
Writing directory...  
.....  
Directory initialized
```

Initialize another diskette [Y/N]?

If you want to initialize another diskette, type **Y** and press **<RET>**. If you are done with DISKINIT, type **N** and press **<RET>**.

If you want to create a new system diskette, type **S** and press **<RET>**. The system displays:

```
Writing directory...  
.....  
Directory initialized
```

Read system data from which drive [A..D]?

Make sure there is a CP/M system diskette in one drive and type the letter of that drive. Then press **<RET>**. The system displays:

Copying system data...

Track nn: Read Write Verify Compare

The last four words appear one after the other, very rapidly, and the space marked *nn* shows the numbers 0 and 1, and 74 to 79. The system is copying CP/M to the diskette you are initializing. After *nn* reaches 79, the system displays:

System data copied

Initialize another disk [Y/N]?

If you want to initialize another diskette, type **Y** and press **<RET>**. If you are done with DISKINIT, type **N** and press **<RET>**. If you are running CP/M from a CP/M system diskette, follow the directions the system displays:

Be sure that the system disk is in drive A, then press RETURN

If you are running CP/M from a CP/M system volume, you will see the CP/M prompt.

DISKINIT Error Messages

ERROR--drive X not ready (or not installed)

You have not installed a diskette in the named drive (drive X), or you gave the name of an uninstalled drive, or you have not closed the drive door. Correct the problem. Then type **Y** and press **<RET>** to start over.

ERROR--drive X is not a diskette

DISKINIT has found that a drive you named (drive X) is a hard disk drive. It contains a hard disk volume not a diskette and you cannot use DISKINIT with hard disk volumes. Type **N** and press **<RET>** to leave DISKINIT, or type **Y** and press **<RET>** to use DISKINIT for another job.

ERROR--cannot initialize this disk type

The diskette is not in RX50 or RX01 format. Install an RX50 or RX01 diskette. Then type **Y** and press **<RET>** to start over.

ERROR--source and destination disks are of different types

You told DISKINIT to copy the system data from one diskette to another, but the two diskettes are not both RX50s. Change the initialized diskette to match the diskette with the system data. Then type **Y** and press **<RET>** to start over.

ERROR--data read back does not match original data

You told DISKINIT to copy the system data from one diskette to another, but the data did not copy properly. Type **Y** and press **<RET>** to start over. If the error repeats, initialize a different diskette.

DISK ERROR--drive X, track nn, sector nn, code nnn
ERROR--disk I/O failed

DISKINIT could not read the diskette in one of the drives. (The name of the drive is represented by X.) Type **Y** and press <RET> to start over, using a different diskette in drive X.

ERROR--source disk does not contain system data

You told DISKINIT to copy the system data from one diskette to another, but the diskette you told DISKINIT to copy from is not a CP/M system diskette. Type **Y** and press <RET> to start over. Use a CP/M system diskette for the system data.

The System Startup Utility Programs

The three utility programs discussed in this section allow you to create self-starting system diskettes and hard disk system volumes.

When the DECmate II system is started, the STARTUP.COM utility program automatically runs and issues one CP/M command. On a newly-created system diskette, STARTUP.COM issues the GREETING command, which displays the CP/M startup banner.

When you use the SETSTART.COM utility program, it creates a new STARTUP.COM file which contains the CP/M command you specify. This command is then executed each time the DECmate II system is started with the diskette or volume containing the new STARTUP.COM program.

GREETING

The GREETING command runs GREETING.COM, a program which displays the CP/M startup banner.

Run this program by typing:

A>GREETING<RET>

You see the CP/M startup banner on the screen. The information on the screen describes the version, release number, and serial number of the CP/M operating system you are using. It also displays the combination of hard disk drives and diskette drives that you can access while using this system diskette. Finally, the drive that contains the CP/M operating system diskette or volume is also listed.

See the **STARTUP** command for information on how the DECmate II system uses this program.

SETSTART

The **SETSTART** command runs **SETSTART.COM**, which allows you to replace **STARTUP.COM**, a utility program which runs automatically whenever the DECmate II system is cold started.

Run **SETSTART** by giving the **SETSTART** command followed by a space and a single CP/M command. Then press **<RET>**. The command you choose becomes part of the new **STARTUP.COM** program. The existing version of **STARTUP.COM** is renamed **STARTUP.BAK**.

The next time you cold start your DECmate II system, the new **STARTUP** command is automatically executed before the CP/M prompt is displayed.

For example, to create a **STARTUP.COM** program that performs a directory of the default diskette or volume before it displays the prompt, type:

```
A>SETSTART DIR<RET>
```

The system replies:

```
SETSTART -- Generate STARTUP Program [1.00]  
New STARTUP.COM file successfully written
```

```
A>
```

The next time you start the DECmate II system, you will see the message, CP/M loading..., the CP/M startup messages, and a directory of your system diskette or volume followed by the CP/M prompt.

You can also use the **SETSTART** command to create a **STARTUP.COM** file that will execute multiple CP/M commands by using the **SUBMIT** command.

First use ED to create a SUBMIT file having the file type .SUB. Then give the SETSTART command folowed by the SUBMIT command and the name of the SUBMIT file.

For example, perform the following steps to create a STARTUP.COM program which first sets up the printer attached to your DECmate II system to print with 12 characters per inch and four lines of text per inch, and then displays the CP/M start up banner and prompt.

Use ED to create the file START.SUB which contains the following commands:

```
PRSETUP CP 12 LP 4  
GREETING
```

Give the SETSTART command, type:

```
A>SETSTART SUBMIT START<RET>
```

The next time you start your DECmate II system, you will see the message, CP/M loading..., and the CP/M startup messages, followed by the PRSETUP and GREETING commands contained in the SUBMIT file. They are replaced by the CP/M startup banner and the CP/M prompt.

Press the **PRINT SCREEN** key to print a copy of the CP/M startup banner with the printer settings you just established.

Setstart Error Messages.

```
No command text, no STARTUP.COM file written
```

You gave the SETSTART command but did not specify a CP/M command. SETSTART did not alter the existing STARTUP.COM program.

STARTUP

The STARTUP.COM utility program automatically runs whenever the DECmate II system is cold started. If you have not used the SETSTART command to replace the STARTUP.COM program, STARTUP.COM executes GREETING.COM— which displays the CP/M startup banner.

Run STARTUP by typing:

```
A>STARTUP<RET>
```

If you are using the original version of STARTUP, you see the CP/M startup banner display on the screen.

PRSETUP

The PRSETUP command runs PRSETUP.COM, a printer setup utility program. Use PRSETUP to set the programmable features of the following DIGITAL printers:

- LA50 (a compact, dot matrix printer)
- LA100 (the letterprinter 100, a dot matrix printer)
- LQP02 (a full-character, letter quality printer)
- LA120 (a dot matrix printer)
- LA34 (a dot matrix printer)
- LQPSE (a full-character, letter quality printer)

This utility program is able to set the following programmable printer characteristics:

- Characters per inch (CP)—The number of characters per horizontal inch of text.
- Left margin position (LM)—The number of character spaces from the left edge of the paper to the location of the first character in a line of text. (See Figure 13.)
- Right margin position (RM)—The number of character spaces from the left edge of the paper to the location of the last possible character position in a line of text. (See Figure 13.)
- Right margin action: (MA)—Tells the printer what to do if the lines of text in the file you want to print are longer than the length of the line of text you established when you set the left and right margin positions. If you select WRAP, the printer prints the remainder of the text on the following line. If you select TRUNCATE, the printer ignores the remainder of the line.

- **Print Density (PD)**—Tells an LA50 or LA100 printer what print quality to use. In normal or draft mode, these printers work rapidly and produce draft-quality output. In enhanced mode (on the LA50) or letter mode (the medium and high settings on the LA100) the output is higher resolution with more fully formed characters.
- **Lines per inch (LP)**—The number of lines of text per vertical inch of paper.
- **Lines per page (PL)**—The number of lines of text on a page of paper.
- **Top margin (TM)**—The number of lines the printer should advance from the top of the page before printing the first line of text. (See Figure 13.)
- **Bottom margin (BM)**—The number of lines from the top of the page to the last line of printed text on the page. (See Figure 13.)

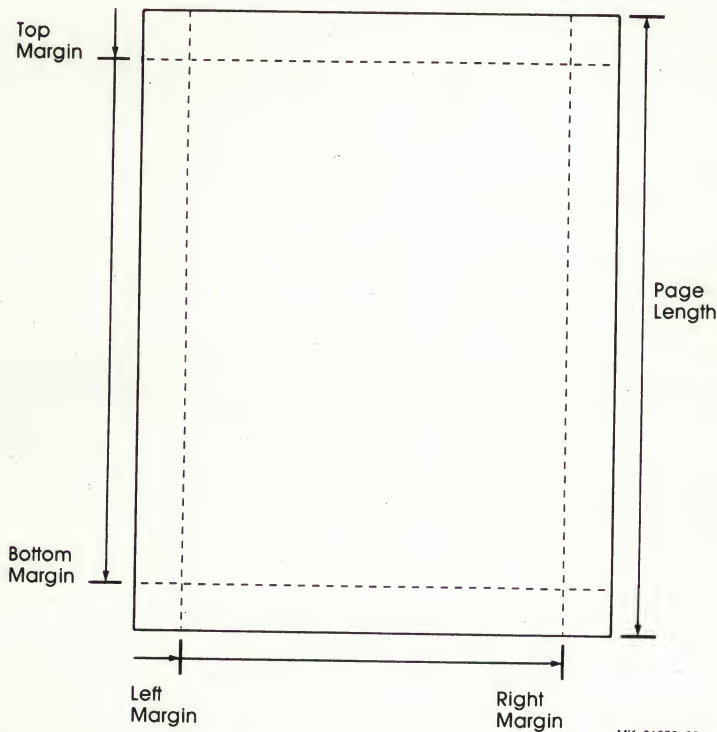


Figure 13 Page Layout for PRSETUP

The PRSETUP utility determines whether or not one of the six printers mentioned previously is attached to your DECmate II system. If no printer is attached to your system, or if a printer is attached but is not one of the six specified printers, PRSETUP issues an error message and displays the CP/M prompt. If one of the six previously mentioned printers is attached to your DECmate II system, PRSETUP identifies the printer and allows you to set only those features that are programmable on the attached printer.

The PRSETUP command can be issued in two ways: Menu mode and Command mode.

In Menu mode, PRESTUP displays all of the programmable characteristics for the attached printer in menu format. Then, one by one, PRSETUP displays the acceptable range of values for each characteristic and allows you to select a value for each.

In Command mode, PRSETUP assumes you know what characteristics are programmable on the attached printer and what the acceptable values are for each characteristic. You invoke the PRSETUP utility in Command mode by issuing the PRSETUP command and entering all your changes on a single command line. You can invoke PRSETUP from a SUBMIT command file if you use Command mode.

Using PRSETUP in Menu Mode

Run PRSETUP in Menu mode by typing:

```
A>PRSETUP<RET>
```

PRSETUP displays a menu which lists the programmable characteristics for the printer attached to your DECmate II system. The menu includes an instructions area at the bottom of the screen. The first line of instructions displays the values that can be entered into the highlighted field in the menu. The last four lines of instructions explain how to select and enter values for the programmable printer characteristics.

You can also type:

```
A>PRSETUP FF<RET>
```

When invoked in this manner, PRSETUP performs a form feed (advances the paper in the printer) before it displays the PRSETUP menu.

Example Using PRSETUP with an LA100 Printer. In the following example, PRSETUP runs in Menu mode with an LA100 printer attached to the DECmate II system. PRSETUP sets all of the programmable characteristics of the LA100 printer.

Run PRSETUP in Menu mode by typing:

A>PRSETUP<RET>

If you have an LA100 printer attached to your DECmate II system, your display looks like Screen 51.

PRINTER SETUP

Printer model: LA100

Characters/inch (CP):	Lines/inch (LP):
Left margin (LM):	Lines/page (PL):
Right margin (RM):	Top margin (TM):
Right margin action (MA):	Bottom margin (BM):
Print Density (PD):	

Characters/inch (CP): 5 6 6.6 8.25 10 12 13.2 16.5

Use < or > to select value, then Press Select to enter it.
 To remove field entry, use Remove. To exit without executing, use CTRL-C

Use ^ or v to select item to change. Press Do to execute.

Screen 51

The highlight is positioned after Characters/inch (CP): and the following instructions are displayed below the menu:

```
Characters/inch (CP): 5 6 6.6 8.25 10 12 13.2 16.5
```

Use < or > to select value, then Press Select to enter it.
To remove field entry, use Remove. To exit without executing, use CTRL-C

Use ^ or v to select item to change. Press Do to execute.

Press the **RIGHT ARROW** or **LEFT ARROW** key to choose a value for the number of characters per horizontal inch. For example, to select 12 characters per inch, press the **RIGHT ARROW** key once. This moves the flashing cursor from 10 to 12. Then press the **SELECT** key. This enters 12 to the right of (CP): in the menu.

Press the **DOWN ARROW** key to move the highlight to Left margin (LM):. The message area at the bottom of the screen changes to:

```
LEFT MARGIN (LM): 1
```

Press Select to enter value shown, or type a new value between 1 and 158.
To remove field entry, use Remove. To exit without executing, use CTRL-C

Use ^ or v to select item to change. Press Do to execute.

To create a left margin of five character spaces, type **5** and press the **SELECT** key. This enters 5 to the right of (LM): in the menu.

Press the **DOWN ARROW** key to move the highlight to Right margin (RM):. The message area at the bottom of the screen changes to:

```
Right margin (RM): 158
```

Press Select to enter value shown, or type a new value between 5 and 158.
To remove field entry, use Remove. To exit without executing, use CTRL-C

Use ^ or v to select item to change. Press Do to execute.

Your right margin can fall anywhere between the left margin and the right edge of the page. To create a right margin 70 character spaces from the left edge of the page, type **70** and press the **SELECT** key. This enters 70 to the right of (RM): in the menu.

Press the **DOWN ARROW** key to move to Right margin action (MA):. The message area at the bottom of the screen changes to:

Right margin action (MA): WRAP TRUNCATE

Use < or > to select value, then Press Select to enter it.
To remove field entry, use Remove. To exit without executing, use CTRL-C

Use ^ or v to select item to change. Press Do to execute.

By setting your left and right margins at 5 and 70 you have created a printed line on your page that is 65 characters long. If the lines of text you want to print are longer than 65 characters, you have to tell the printer what to do with the remainder of the line. If you want the printer to wrap around and print the remainder of the text on the next line, select WRAP. If you want the printer to disregard the end of the line, select TRUNCATE.

To instruct the LA100 to disregard the ends of lines of text longer than 65 characters, select TRUNCATE. Press the **SELECT** key. This enters TRUNCATE to the right of (MA): in the menu.

Press the **DOWN ARROW** key to move to Print density (PD):. The message area at the bottom of the screen changes to:

Print density (PD): DRAFT MEDIUM HIGH

Use < or > to select value, then Press Select to enter it.
To remove field entry, use Remove. To exit without executing, use CTRL-C.

Use ^ or v to select item to change. Press DO to execute.

If you want your printer to work rapidly and to print draft-quality output, select DRAFT. If you want your output to be of higher quality, with more fully formed characters, select either MEDIUM or HIGH print density.

To instruct the LA100 to print with medium print density, select MEDIUM. Press the **RIGHT ARROW** key once to select MEDIUM, then press **SELECT**. This enters MEDIUM to the right of (PD): in the menu.

Press the **DOWN ARROW** key to move to Lines/inch (LP):. The message area at the bottom of the screen changes to:

Lines/inch (LP): 2 3 4 6 8 12

Use < or > to select value, then Press Select to enter it.
To remove field entry, use Remove. To exit without executing, use CTRL-C

Use ^ or v to select item to change. Press Do to execute.

Use the arrow keys to choose a value for the number of lines of text per page. For example, to select 4 lines of text per inch, use the **LEFT ARROW** key to move the cursor to 4. Then press the **SELECT** key. This enters 4 to the right of (LP): in the menu.

Press the **DOWN ARROW** key to move to Lines/page (PL):. The message area at the bottom of the screen changes to:

```
Lines/Page (PL): 44
```

Press Select to enter value shown, or type a new value between 0 and 84.
To remove field entry, use Remove. To exit without executing, use CTRL-C

Use ^ or v to select item to change. Press Do to execute.

To create a page length of 40 lines per page, type **40** and press the **SELECT** key. This enters 40 to the right of (PL): in the menu.

Press the **DOWN ARROW** key to move the highlight to Top margin (TM):. The message area at the bottom of the screen changes to:

```
Top margin (TM): 1
```

Press Select to enter value shown, or type a new value between 1 and 40.
To remove field entry, use Remove. To exit without executing, use CTRL-C

Use ^ or v to select item to change. Press Do to execute.

To create a top margin of 5 lines, type **5** and press the **SELECT** key. This enters 5 to the right of (TM): in the menu.

Press the **DOWN ARROW** key to move the highlight to Bottom margin (BM):. The message area changes to:

```
Bottom margin (BM): 40
```

Press Select to enter value shown, or type a new value between 5 and 40.
To remove field entry, use Remove. To exit without executing, use CTRL-C

Use ^ or v to select item to change. Press Do to execute.

The bottom margin is measured down from the top of the page. It can fall anywhere between the top margin and the bottom of the page.

To create a bottom margin 35 lines down from the top of the page, type **35** and press the **SELECT** key. This enters 35 to the right of (BM): in the menu.

Your screen should now look like Screen 52.

```

PRINTER SETUP

Printer model: LA100

Characters/inch (CP): 12          Lines/inch (LP): 4
Left margin (LM): 5             Lines/page (PL): 40
Right margin (RM): 70           Top margin (TM): 5
Right margin action (MA): TRUNCATE Bottom margin (BM): 35
Print density (PD): MEDIUM

Bottom margin (BM): 35

Press Select to enter value shown, or type a new value between 5
and 40.
To remove field entry, use Remove. To exit without executing, use
CTRL-C

Use ^ or v to select item to change. Press Do to execute.
```

Screen 52

If you want to change a menu selection, use the UP ARROW and DOWN ARROW keys to move the highlight to the menu item you want to change. Press the REMOVE key to remove the setting you want to change. Then, to make a new selection, follow the directions in the message area at the bottom of the screen.

When all of the menu selections are correct, press the **DO** key. This sends the settings to the printer, sets the top margin by advancing the paper, and displays the CP/M prompt. You are now ready to print.

You do not have to select a new value for every menu selection (programmable characteristic). PRSETUP sets only the characteristics for which you select new values. If you want to skip over a menu selection without changing its value, use the UP ARROW and DOWN ARROW keys to move the highlight over the menu item without changing it.

Setting up an LA50 Printer. If you run PRSETUP with a LA50 printer attached to your DECmate II system, your display looks like Screen 53.

The screenshot shows a terminal window titled "PRINTER SETUP". The "Printer model:" is set to "LA50". Below this, there are fields for "Characters/inch (CP):", "Lines/inch (LP):", and "Lines/page (PL):". Further down, "Print density (PD):" is shown. A list of acceptable values for "Characters/inch (CP)" is displayed: 5, 6, 8.25, 10, 12, and 16.5, with "10" currently selected. At the bottom, instructional text explains how to navigate the menu: "Use < or > to select value, then press Select to enter it. To remove field entry, use Remove. To exit without executing, use CTRL-C" and "Use ^ or v to select item to change. Press Do to execute."

```
PRINTER SETUP

Printer model: LA50

Characters/inch (CP):      Lines/inch (LP):
                           Lines/page (PL):

Print density (PD):

Characters/inch (CP):  5  6  8.25  10  12  16.5

Use < or > to select value, then press Select to enter it.
To remove field entry, use Remove. To exit without executing, use
CTRL-C

Use ^ or v to select item to change. Press Do to execute.
```

Screen 53

Use the procedures for changing values described in the previous section, Example Using PRSETUP with an LA100 Printer. The message area at the bottom of the screen gives instructions and lists all of the acceptable values for each programmable characteristic.

Setting Up an LQP02 Printer. If you run PRSETUP with an LQP02 printer attached to your DECmate II system, your display looks like Screen 54.

PRINTER SETUP

Printer model: LQP02

Characters/inch (CP):		Lines/inch (LP):	
Left margin (LM):		Lines/Page (PL):	
Right margin (RM):		Top margin (TM):	
Right margin action (MA):		Bottom margin (BM):	

Characters/inch (CP): 10 12 15

Use < or > to select value, then press Select to enter it.
To remove field entry, use Remove. To exit without executing, use CTRL-C

Use ^ or v to select item to change. Press Do to execute.

Screen 54

Use the procedures for changing values described in the section, Example Using PRSETUP with an LA100 Printer. The message area at the bottom of the screen gives instructions and lists all of the acceptable values for each programmable characteristic.

Setting Up an LA120 Printer. If you run PRSETUP with an LA120 printer attached to your DECmate II system, your display looks like Screen 55.

```

                                PRINTER SETUP
                                Printer model: LA120

    Characters/inch (CP):      Lines/inch (LP):
    Left margin (LM):         Lines/Page (PL):
    Right margin (RM):        Top margin (TM):
    Right margin action (MA):  Bottom margin (BM):

    Characters/inch (CP): 5  6  6.6  8.25  10  12  13.2  16.5
    Use < or > to select value, then Press Select to enter it.
    To remove field entry, use Remove. To exit without executing, use
    CTRL-C
    Use ^ or v to select item to change. Press Do to execute.
```

Screen 55

Use the procedures for changing values described in the section, Example Using PRSETUP with an LA100 Printer. The message area at the bottom of the screen gives instructions and lists all of the acceptable values for each programmable characteristic.

Setting Up an LA34 Printer. If you run PRSETUP with an LA34 printer attached to your DECmate II system, your display looks like Screen 56.

```
PRINTER SETUP

Printer model: LA34

Characters/inch (CP): 
Lines/inch (LP): 
Left margin (LM): 
Right margin (RM): 

Characters/inch (CP): 10 12 13.2 16.5

Use < or > to select value, then press Select to enter it.
To remove field entry, use Remove. To exit without executing, use
CTRL-C

Use ^ or v to select item to change. Press Do to execute.
```

Screen 56

Use the procedures for changing values described in the section, Example Using PRSETUP with an LA100 Printer. The message area at the bottom of the screen gives instructions and lists all of the acceptable values for each programmable characteristic.

Setting Up an LQPSE Printer. If you run PRSETUP with an LQPSE printer attached to your DECmate II system, your display looks like Screen 57.

PRINTER SETUP

Printer model: LQPSE

Characters/inch (CP): Lines/inch (LP):

Left margin (LM): Lines/page (PL):

Characters/inch (CP): 10 12 15

Use < or > to select value, then press Select to enter it.
To remove field entry, use Remove. To exit without executing, use CTRL-C

Use ^ or v to select item to change. Press Do to execute.

Screen 57

Use the procedures for changing values described in the section, Example Using PRSETUP with an LA100 Printer. The message area at the bottom of the screen gives instructions and lists all of the acceptable values for each programmable characteristic.

Using PRSETUP in Command Mode

Run PRSETUP in command mode by typing PRSETUP followed by a code for a printer characteristic you want to set and the value you want to specify.

Separate each code and value with one space. You can set several codes with a single PRSETUP command, but all the information must fit on one command line.

In order to use PRSETUP in command mode you must know all of the following:

- The programmable characteristics which are available on the printer attached to your system
- The code for each programmable characteristic
- The acceptable values for each programmable characteristic

Table 23 lists the programmable characteristics that you can set with PRSETUP and the codes that are associated with them. Tables 24 through 29 list the programmable characteristics available on each DECmate II printer and the acceptable values for each characteristic. Refer to these tables as you use PRSETUP in command mode.

Examples Using PRSETUP in Command Mode. For example, typing:

```
A> PRSETUP CP 12 PL 66<RET>
```

sets the printer characteristics characters/inch (CP) to 12 and page length (PL) to 66 lines.

Typing:

```
A> PRSETUP LM 5 RM 70 TM 6 BM 60<RET>
```

sets the printer characteristics left margin (LM) to 5, right margin (RM) to 70, top margin (TM) to 6 and bottom margin (BM) to 60. This gives you a printed page with lines of text 65 characters wide, with a top margin six spaces below the top of the page, and with a bottom margin 60 spaces below the top of the page.

Table 23 Codes for Programmable Printer Characteristics

Code	Programmable Characteristic
CP	Characters per inch
LM	Left margin position
RM	Right margin position
MA	Wrap or truncate lines of text at right margin
PD	Print density
LP	Lines of text per vertical inch
PL	Lines of text per page
TM	Top margin position
BM	Bottom margin position
FF	Perform a form feed before sending the selected settings to the printer

The following tables list the programmable characteristics available for each printer and the acceptable values for each characteristic.

Table 24 Programmable Characteristics on LQP02 Printer

Characteristic	Acceptable Values
CP	10, 12, 15
LM	1 to 198
RM	LM to 198
MA	WRAP or TRUNCATE
LP	2, 3, 4, 6, 8
PL	1 to 168
TM	1 to PL
BM	TM to PL

Table 25 Programmable Characteristics on LA50 Printer

Characteristic	Acceptable Values
CP	5, 6, 8.25, 10, 12, 16.5
PD	NORMAL ENHANCED
LP	2, 3, 4, 6, 8, 12
PL	1 to 252

Table 26 Programmable Characteristics on LA100 Printer

Characteristic	Acceptable Values
CP	5, 6, 6.6, 8.25, 10, 12, 13.2, 16.5
LM	1 to 217
RM	LM to 217
MA	WRAP or TRUNCATE
PD	DRAFT MEDIUM HIGH
LP	2, 3, 4, 6, 8, 12
PL	0 to 168
TM	1 to PL
BM	TM to PL

Table 27 Programmable Characteristics on LA120 Printer

Characteristic	Acceptable Values
CP	5, 6, 6.6, 8.25, 10, 12, 13.2, 16.5
LM	1 to 217
RM	LM to 217
MA	WRAP or TRUNCATE
LP	2, 3, 4, 6, 8, 12
PL	0 to 168
TM	1 to PL
BM	TM to PL

Table 28 Programmable Characteristics on LA34 Printer

Characteristic	Acceptable Values
CP	10 12 13.2 16.5
LM	1 to 217
RM	LM to 217
LP	2 3 4 6 8 12

Table 29 Programmable Characteristics on LQPSE Printer

Characteristic	Acceptable Values
CP	10 12 15
LM	1 to 198
LP	2 3 4 6 8
PL	1 to 172

PRSETUP Error Messages

BAD COMMAND LINE SYNTAX

You incorrectly entered a PRSETUP command in command mode. Re-enter the command following the rules discussed in the Using PRSETUP in Command Mode section of this chapter.

Invalid response received from printer

The PRSETUP utility received a response from the attached printer that it could not understand. Check to see that the printer is properly attached to your system, and that it is one of the six printers supported by the PRSETUP utility.

Invalid XXXXXX selection

Where XXXXXX is one of the up to nine programmable characteristics which PRSETUP can set. The value you selected for the programmable characteristic, XXXXXX, is not a valid choice for your printer. Re-enter the PRSETUP Command mode command with an appropriate value.

INVALID: XXXXXX TOO LARGE

Where XXXXXX is either PAGE LENGTH, BOTTOM MARGIN VALUE, or TOP MARGIN VALUE. The value you selected for the programmable characteristic XXXXXX is too large. Re-enter the PRSETUP Command mode command with an appropriate value.

INVALID: XXXXXX TOO SMALL

Where XXXXXX is either PAGE LENGTH, BOTTOM MARGIN VALUE, TOP MARGIN VALUE, RIGHT MARGIN VALUE, or LEFT MARGIN VALUE. The value you selected for the programmable characteristic XXXXXX is too small. Re-enter the PRSETUP Command mode command with an appropriate value.

INVALID: XXXXXX > CARRIAGE WIDTH

Where XXXXXX is either RIGHT MARGIN or LEFT MARGIN. The value you selected for the programmable characteristic XXXXXX is greater than the width of the carriage on your printer. Re-enter the PRSETUP Command mode command with an appropriate value.

INVALID: XXXXXX > PAGE LENGTH

Where XXXXXX is either BOTTOM MARGIN or TOP MARGIN. The value you selected for the programmable characteristic XXXXXX is greater than the page length on your printer. Re-enter the PRSETUP Command mode command with an appropriate value.

INVALID: LEFT MARGIN > RIGHT MARGIN

The value you entered for LEFT MARGIN is greater than the value you entered for RIGHT MARGIN. Re-enter the PRSETUP Command mode command with appropriate values.

INVALID: TOP MARGIN > BOTTOM MARGIN

The value you entered for TOP MARGIN is greater than the value you entered for BOTTOM MARGIN. Re-enter the PRSETUP Command mode command with appropriate values.

New value is too high

The value you entered for a programmable characteristic is too large. Press the **Rubout** key to erase the value from the screen; then select a new value.

New value is too low.

The value you entered for a programmable characteristic is too small. Press the **Rubout** key to erase the value from the screen; then select a new value.

No response received from Printer - check baud rate.

You gave the PRSETUP command but PRSETUP is unable to communicate with the attached printer usually because the baud rate setting of the printer and the DECmate II baud rate setting are not the same. The easiest way to correct this error is to use the DECmate II SET-UP key to change the DECmate II printer baud rate setting to match the baud rate setting of the printer.

If you want to check the baud rate setting of the printer, refer to your printer manual.

You will also see this message if your printer is not connected to your system when you give the PRSETUP command. Check to see that the printer is turned on and that it is properly connected to your DECmate II system. Then, give the PRSETUP command again.

Printer type not supported by this program
UNKNOWN PRINTER

The PRSETUP utility received a response from the attached printer, but PRSETUP cannot identify the printer. Check to see that the printer is one of the six printers supported by the PRSETUP utility.

XXXXXX not available for the YYYYYY

Where XXXXXX is one of the nine programmable characteristics that PRSETUP can set, and YYYYYY is the name of the attached printer. You tried to set a programmable characteristic which is not available on your printer. Re-enter the PRSETUP command. Be sure to specify only settings which are programmable on your printer.

WPSCONV

The WPSCONV command runs WPSCONV.COM, a CP/M utility program which converts:

- CP/M text files to WPS documents, and
- WPS documents to CP/M text files.

WPSCONV allows you to edit CP/M text files with WPS and include them in word processed reports. WPSCONV also allows you to write programs using the WPS operating system and to convert them to CP/M text files.

The CP/M text file you want to convert must be an ASCII print file. For example:

- A file created with the Multiplan Print File command
- A file created with the CP/M editor
- A report created by an applications program

You can use the TYPE command to determine whether or not a CP/M file is a text file. For example, to check a CP/M file named EXAMPLE, type:

```
A>TYPE EXAMPLE<RET>
```

If the file appears on the screen in readable form, then it is a text file.

WPS documents can be accessed in all of the following ways:

- By typing the full document name
- By typing the document number
- By typing the first section of the document name which identifies the document

WPS refers to the RX50 diskette drives as drives 0 and 1, (or 0, 1, 2, and 3 if you have four drives). CP/M refers to these same diskette drives as A, B, C, and D. WPSCONV understands both forms of diskette drive references.

If your DECmate II system includes optional RX01/RX02 diskette drives, WPS refers to the RX01/RX02 drives as 4, 5, 6, and 7. CP/M refers to these same drives as E, F, G, and H. WPSCONV understands both forms of diskette drive references.

If your DECmate II system includes an RD51 hard disk system, CP/M refers to the hard disk drives as E, F, G, and H. You can store CP/M files in hard disk volumes; but, you may not store WPS documents in hard disk volumes.

NOTE: *If you need to access a hard disk volume to convert or store CP/M text files, you must mount the CP/M volume before you run WPSCONV. See Chapter 6 for information about the commands for using the hard disk.*

Running WPSCONV

Run WPSCONV by typing:

```
A> WPSCONV<RET>
```

The system displays the WPSCONV command menu as shown in Screen 58. Make a menu selection by typing the designated letters and pressing <RET>.

Anytime a WPSCONV option is waiting for you to enter data and you decide to cancel the operation instead of proceeding, press F8, the CANCEL key. This stops the WPSCONV operation and returns you to the WPSCONV command menu. Whenever WPSCONV is working, it displays the message, Working..., in the bottom left corner of the screen.

```
WPSCONV      CP/M-WPS File Conversion Utility

DI = Directory of CP/M drive
IN = Index of WPS disk

CP = Convert CP/M file to WPS
WP = Convert WPS document to CP/M

TC = Transfer multiple CP/M files to WPS
TW = Transfer multiple WPS documents to CP/M

EX = Exit to CP/M

Enter selection and Press Return: 
```

Screen 58

The WPSCONV command menu gives you the following choices. You can:

- Select DI to see a directory of the diskette or volume containing the CP/M files.
- Select IN to see a directory of the diskette containing the WPS files.
- Select CP to convert a single CP/M text file to a WPS document.
- Select WP to convert a single WPS document to a CP/M text file.
- Select TC to convert multiple CP/M text files to WPS documents.
- Select TW to convert multiple WPS documents to CP/M text files.
- Select EX to leave the WPSCONV program.

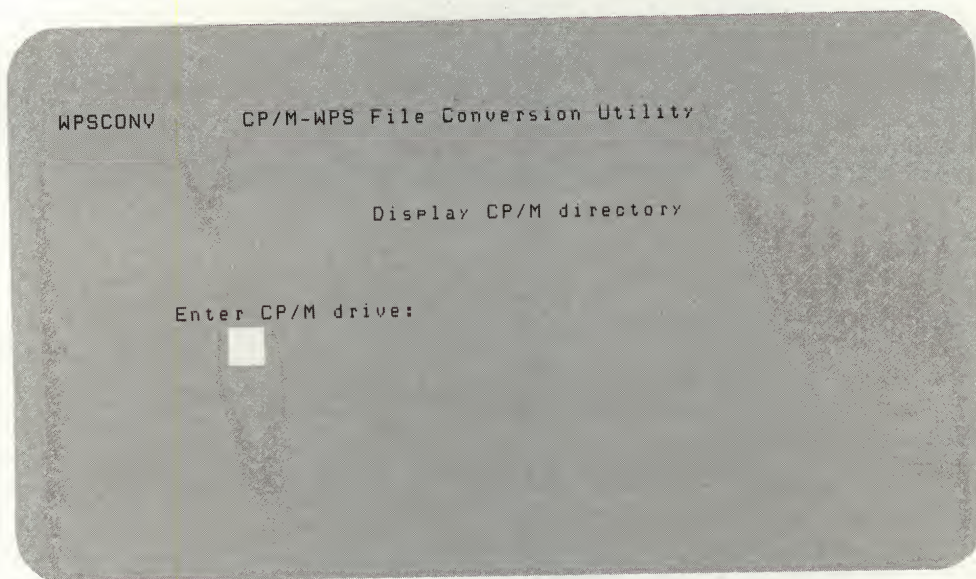
If your DECmate II system has only two diskette drives, remove the system diskette from drive A. You will need to use both drives to convert files.

Insert your WPS document diskette into a diskette drive and close the drive door.

If you are using a CP/M diskette, insert the diskette into another diskette drive and close the drive door. (In order to use a CP/M hard disk volume, you must have mounted the volume before you issued the WPSCONV command. See Chapter 6 for information about the commands for using the hard disk.)

Displaying a Directory of the CP/M Files. The WPSCONV DI option displays a directory of the files on a CP/M diskette or volume in the drive you specify.

When you select **DI** from the WPSCONV command menu, the system responds with the display shown in Screen 59.



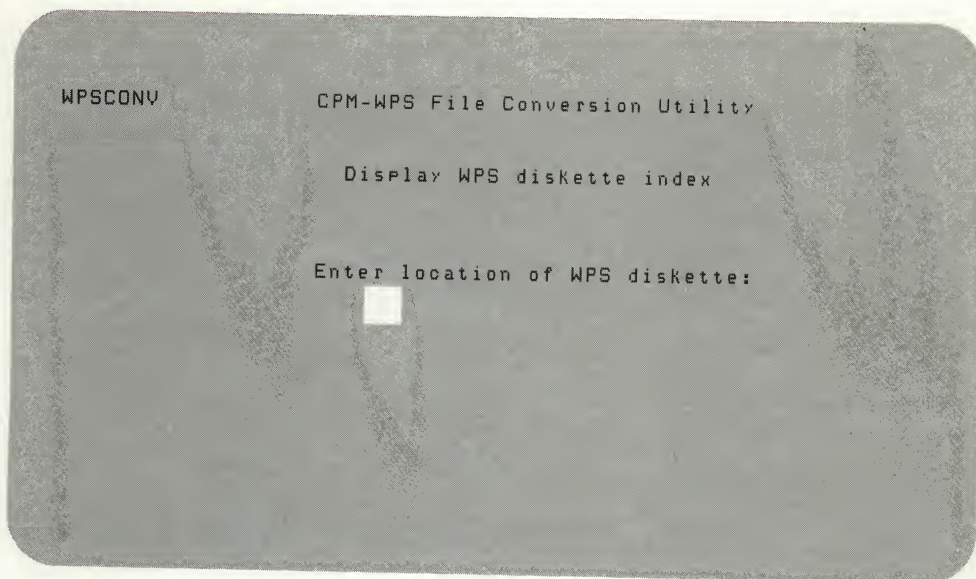
Screen 59

Enter the letter (or number) of the drive containing the CP/M diskette or volume and press **<RET>**.

The system responds by displaying a directory of the CP/M diskette or volume. Press either **<RET>** or **F8**, the CANCEL key, to return to the WPSCONV command menu.

Displaying an Index of the WPS Document Diskette. The WPSCONV IN option displays an index of the documents on a WPS diskette in the drive you specify.

When you select **IN** from the WPSCONV command menu, the system responds with the display shown in Screen 60.



Screen 60

Enter the letter (or number) of the drive containing the WPS diskette and press **<RET>**.

The system responds by displaying an index of the diskette that contains the WPS documents.

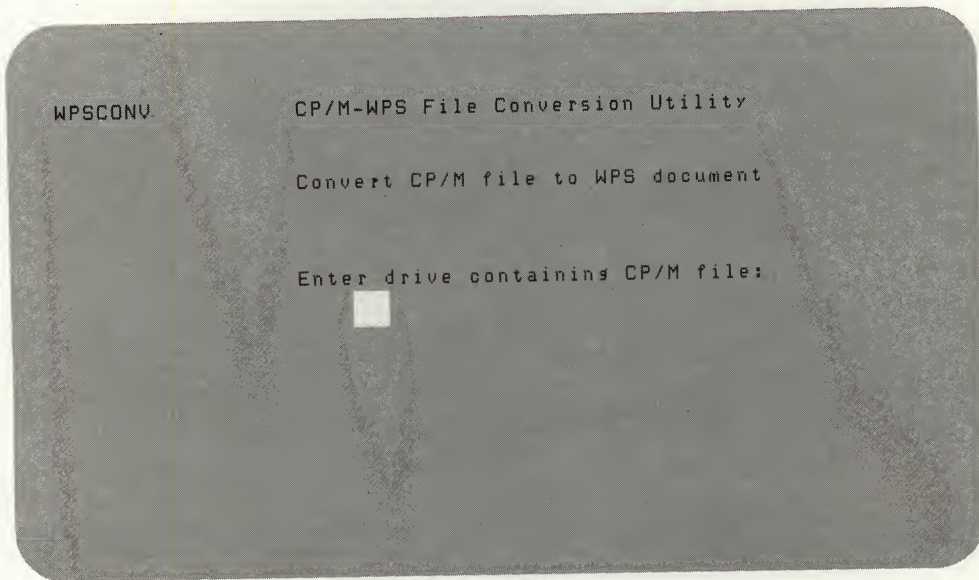
If the entire index of WPS files fits on a single screen, press either **<RET>** or **F8**, the CANCEL key, to return to the WPSCONV command menu.

If the index requires multiple screens, press **<RET>** to display the next screen; or, press **F8**, the CANCEL key, to return to the WPSCONV command menu.

WPSCONV does not mark your converted WPS files with a date/time stamp. The date on which you edit a converted WPS file is recorded as the modified date.

Converting Single CP/M Text Files to WPS Documents. The WPSCONV CP option converts single CP/M text files to WPS documents.

When you select **CP** from the WPSCONV command menu, the system responds with the display shown in Screen 61:



Screen 61

Enter the letter (or number) of the drive containing the CP/M diskette or volume and press **<RET>**. The system asks:

Enter CP/M file name:

Type the name of the CP/M text file and press **<RET>**. You must enter the CP/M file name and file type exactly as they are shown in the directory of the CP/M diskette or volume (obtained by using the DI option). If you use both a file name and file type, they must be separated by a period.

After you enter the CP/M filename, the system asks:

Enter drive to receive WPS document:

Type either the letter (or number) of the drive that contains the WPS diskette. Then press **<RET>**. The system displays the following message:

Enter name of WPS document:

Type the name of the WPS document you are creating with WPSCONV and press **<RET>**. Follow the rules for naming WPS documents.

WPSCONV checks to see if the WPS diskette contains a document with the name you chose for the new WPS document.

- If WPSCONV does not find a WPS document by that name, it replies:

```
Converting DriveLetter:FileName.FileType to
      DriveNumber.DocumentName
```

Proceed with conversion (Y or N):

WPSCONV displays the drive name, file name, and file type of the CP/M file in CP/M format and the WPS drive number and document name in WPS format.

If you select N, the file is not converted. WPSCONV asks you for the drive and name of another CP/M file to convert.

If you select **Y**, the file is converted and WPSCONV displays the following message:

```
This file has been converted.
Press Return to continue or Cancel to return to menu.
```

Press either **<RET>** or **F8**, the CANCEL key, to return to the WPSCONV menu.

- If WPSCONV finds a WPS document with that name, it replies:

```
DriveNumber.DocumentName already exists
Do you want to overwrite it (Y or N):
```

- If you select **N**, WPSCONV asks again for the WPS drive and document name.

Enter the letter (or number) of the drive containing the WPS diskette and press **<RET>**. Then, enter a different WPS document name and press **<RET>**. This allows you to convert the CP/M file to a WPS document without overwriting the existing document. WPSCONV replies:

```
Converting DriveLetter:FileName.FileType to
      DriveNumber.DocumentName
```

Proceed with conversion (Y or N):

If you select N, the file is not converted. WPSCONV asks you for the drive and name of another CP/M file to convert.

If you select Y, WPSCONV converts the file and replies:

```
This file has been converted.
Press Return to continue or Cancel to return to
menu.
```

Press either **<RET>** or **F8**, the CANCEL key, to return to the WPSCONV command menu.

- If you select Y, WPSCONV replies:

```
Converting DriveLetter:FileName.FileType to
      DriveNumber.DocumentName
```

Proceed with conversion (Y or N):

If you select N, the file is not converted. WPSCONV asks you for the drive and name of another CP/M file to convert.

If you select Y, WPSCONV converts the file and replies:

```
This file has been converted.
Press Return to continue or Cancel to return to
menu.
```

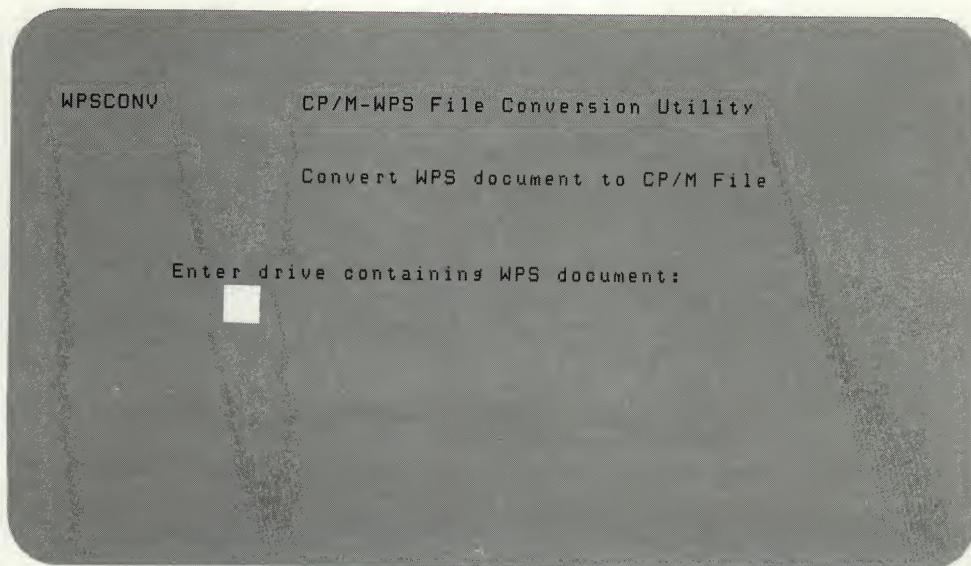
Press either **<RET>** or **F8**, the CANCEL key, to return to the WPSCONV command menu.

The WPS document you created by converting a CP/M text file has the following characteristics:

- The WPS document has a ruler with left margin set at 1, right margin set at 132, and left-justified tab markers every 8 spaces.
- Tabs in the CP/M text file are converted to left-justified tab markers in the WPS ruler. You must start the WPS operating system and advance the cursor through the document to arrange the text at the tab positions.
- Form feeds in the CP/M text file are converted to NEW PAGE Markers in the WPS document.
- Returns in the CP/M text file are converted to hard return characters in the WPS document.

Converting Single WPS Documents to CP/M Text Files. The WPSCONV WP option converts single WPS documents to CP/M text files.

When you select **WP** from the WPSCONV command menu, the system responds with the display shown in Screen 62:



Screen 62

Enter the letter (or number) of the drive containing the WPS diskette and press **<RET>**. The system asks:

Enter WPS document name:

Type the name of the WPS document and press **<RET>**. The system asks:

Enter drive to receive the CP/M file:

Type the letter (or number) of the drive containing the CP/M diskette or volume and press **<RET>**. The system asks:

Enter CP/M file name:

Type the name of the CP/M text file you are creating with WPSCONV and press **<RET>**.

WPSCONV checks to see if the CP/M diskette or volume contains a file with the name you chose for the new CP/M text file.

- If WPSCONV does not find a CP/M file by that name, it replies:

```
Converting
  DriveNumber.DocumentName
    to DriveLetter:FileName.FileType
```

Proceed with conversion (Y or N):

WPSCONV displays the drive name, file name, and file type of the CP/M file in CP/M format and the WPS drive number and document name in WPS format.

If you select N, the document is not converted. WPSCONV asks you for the drive and name of another WPS document to convert.

If you select **Y**, the document is converted. WPSCONV displays the following message:

```
This document has been converted.
Press Return to continue or Cancel to return to menu.
```

Press either **<RET>** or **F8**, the CANCEL key, to return to the WPSCONV menu.

- If WPSCONV finds a CP/M file with that name, it replies:

```
DriveLetter:FileName.FileType already exists
Do you want to overwrite it (Y or N):
```

- If you select **N**, WPSCONV asks again for the CP/M drive and file name.

Enter the letter (or number) of the drive containing the CP/M diskette or volume and press **<RET>**. Then, enter a different CP/M file name and press **<RET>**. This allows you to convert the WPS document to a CP/M file without overwriting the existing file.

WPSCONV replies:

```
Converting
  DriveNumber.DocumentName
    to DriveLetter:FileName.FileType
```

Proceed with conversion (Y or N):

If you select **N**, the file is not converted. WPSCONV asks you for the drive and name of another CP/M file to convert.

If you select **Y**, WPSCONV converts the document and replies:

```
This document has been converted.
Press Return to continue or Cancel to return to
menu.
```

Press either **<RET>** or **F8**, the CANCEL key, to return to the WPSCONV command menu.

- If you select **Y**, WPSCONV replies:

```
Converting
  DriveNumber.DocumentName
    to DriveLetter:FileName.FileType
```

Proceed with conversion (Y or N):

If you select **N**, the file is not converted. WPSCONV asks you for the drive and name of another CP/M file to convert.

If you select **Y**, WPSCONV converts the document and replies:

This document has been converted.
Press Return to continue or Cancel to return to
menu.

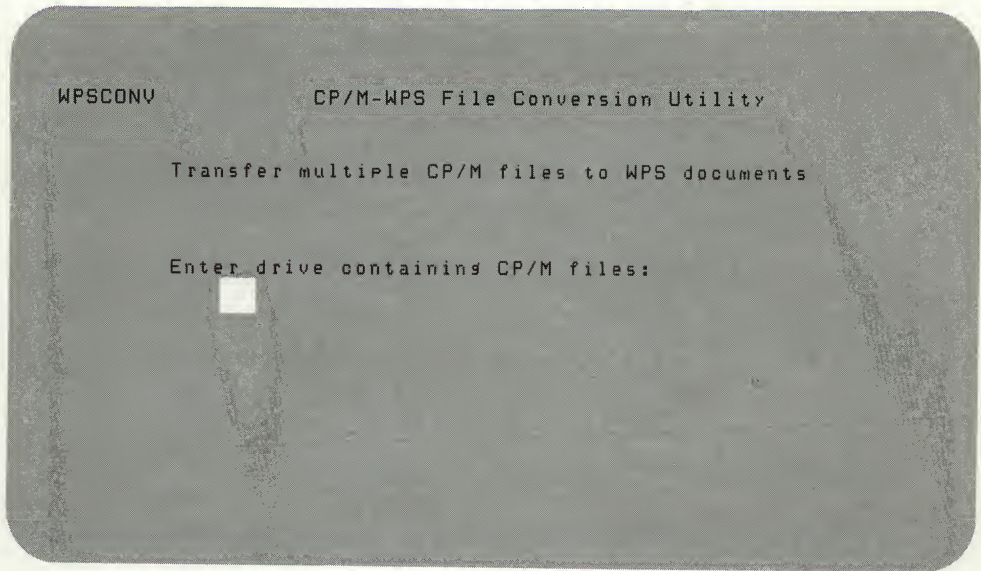
Press either **<RET>** or **F8**, the CANCEL key, to return to the WPSCONV command menu.

The CP/M text file you created by converting a WPS document has the following characteristics:

- Soft spaces in the WPS document are converted to hard spaces in the CP/M text file.
- Line-end markers are converted to hard returns.
- Line-end markers are converted to form feeds.
- Rulers are lost.
- Bolding and underlining are lost.
- Superscripts and subscripts are printed as regular text.
- Composite characters (created using the Gold DEAD KEY feature) are converted as the individual characters that comprise the DEAD KEY sequence. The dead key designation is lost.
- The text within a print control block is converted as normal text. The print control designation is lost.

Converting Multiple CP/M Text Files to WPS Documents. The WPSCONV TC option presents the files in the directory of the CP/M diskette or volume one at a time and asks whether or not you want to convert each file. For each file you select to convert, WPSCONV checks to see if the WPS document name you chose for the converted document exists. WPSCONV then asks whether you want to overwrite the existing document or convert the file to a WPS document of a different name.

When you select **TC** from the WPSCONV command menu, the system responds with the display shown in Screen 63:



Screen 63

Enter the letter (or number) of the drive containing the CP/M diskette or volume and press <RET>. The system asks:

Enter drive to contain WPS documents:

Enter the letter (or number) of the drive that contains the WPS diskette and press <RET>. The system asks:

Do you want to transfer

X:FileName.FileType to WPS drive Y. (Y or N):

In the message above, X represents the drive containing the CP/M diskette or volume and FileName.FileType represents the unambiguous file reference for the first file in the directory of the CP/M diskette or volume. Y represents the drive which contains the WPS diskette.

If you select N, WPSCONV asks if you want to convert the next file in the directory.

If you select **Y**, WPSCONV asks:

Enter name of WPS document:

Type the name of the WPS document that you are creating and press **<RET>**

WPSCONV checks to see if the WPS diskette contains a document with the name you chose for the new WPS document.

- If WPSCONV does not find a WPS document with that name, it replies:

```
Converting
  DriveLetter:FileName.FileType
    to DriveNumber.DocumentName
```

Proceed with conversion (Y or N):

If you select **N**, WPSCONV asks you if you want to convert the same file.

If you select **Y**, WPSCONV converts the file and replies:

```
This file has been converted.
Press Return to continue or Cancel to return to menu.
```

Press **<RET>** to see WPSCONV display the name of the next document.
Press **F8**, the CANCEL key, to return to the WPSCONV menu.

- If WPSCONV finds a WPS document with that name, it replies:

```
DriveNumber.DocumentName already exists
Do you want to overwrite it (Y or N):
```

- If you select **N**, WPSCONV asks:

Enter name of WPS document:

Enter a different WPS document name and press **<RET>**. This allows you to convert the CP/M file to a WPS document without overwriting the existing document. WPSCONV replies:

```
Converting
  DriveLetter:FileName.FileType
    to DriveNumber.DocumentName
```

Proceed with conversion (Y or N):

If you select N, WPSCONV asks you if you want to convert the same file.

If you select Y, WPSCONV converts the file and replies:

This file has been converted.
Press Return to continue or Cancel to return to menu.

Press <RET> to see WPSCONV display the name of the next file.
Press F8, the CANCEL key, to return to the WPSCONV menu.

- If you select Y, WPSCONV replies:

```
Converting
  DriveLetter:FileName.FileType
        to DriveNumber.DocumentName
```

Proceed with conversion (Y or N):

If you select N, WPSCONV asks you if you want to convert the same file.

If you select Y, WPSCONV converts the file and replies:

This file has been converted.
Press Return to continue or Cancel to return to menu.

Press <RET> to see WPSCONV display the name of the next file.
Press F8, the CANCEL key, to return to the WPSCONV menu.

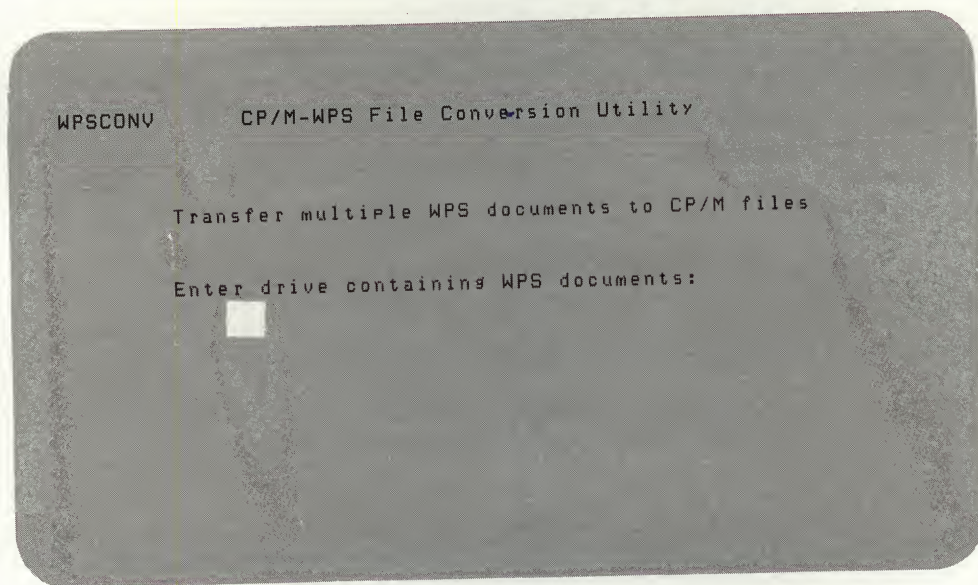
WPSCONV presents all the files in the CP/M diskette or volume directory one by one. After the last file, WPSCONV replies:

Selected files have been transferred.
Press Return or Cancel to return to menu.

Press either <RET> or F8, the CANCEL key to return to the WPSCONV command menu.

Converting Multiple WPS Documents to CP/M Text Files. The WPSCONV TW option presents the names of the documents on the WPS diskette one at a time and asks you whether or not you want to convert each document. For each document you select to convert, WPSCONV checks to see if the CP/M file name you chose for the converted file exists. WPSCONV then asks you whether you want to overwrite the existing file or convert the document to a CP/M file of a different name.

When you select **TW** from the WPSCONV command menu, the system responds with the display shown in Screen 64:



Screen 64

Enter the letter (or number) of the drive containing the WPS diskette and press **<RET>**. The system asks:

Enter drive to receive CP/M files:

Enter the letter (or number) of the drive containing the CP/M diskette or volume and press **<RET>**. The system asks:

Do you want to transfer
X.DocumentName to Drive Y: (Y or N):

In the message above, X represents the drive containing the WPS diskette and DocumentName represents the name of the first entry in the index of the WPS diskette. Y represents the drive that contains the CP/M diskette or volume.

If you reply N, WPSCONV asks if you want to convert the next document in the index.

If you reply Y, WPSCONV asks:

Enter name of CP/M file:

Type the name of the CP/M file you are creating and press <RET>.

WPSCONV checks to see if the CP/M diskette or volume contains a file with the name you chose for the new CP/M text file.

- If WPSCONV does not find a CP/M file by that name, it replies:

```
Converting
  DriveNumber.DocumentName
    to DriveLetter:FileName.FileType
```

Proceed with conversion (Y or N):

If you select N, WPSCONV asks you if you want to convert the same file.

If you select Y, WPSCONV converts the document and replies:

```
This document has been converted.
Press Return to continue or Cancel to return to menu.
```

Press <RET> to see WPSCONV display the name of the next document. Press F8, the CANCEL key, to return to the WPSCONV menu.

- If WPSCONV finds a CP/M file with that name, it replies:

```
DriveLetter:FileName.FileType already exists
Do you want to overwrite it (Y or N):
```

- If you select **N**, WPSCONV asks:

Enter name of CP/M file:

Enter a different CP/M file name and press **<RET>**. This allows you to convert the WPS document to a CP/M file without overwriting the existing file. WPSCONV replies:

```
Converting
  DriveNumber.DocumentName
    to DriveLetter:FileName.FileType
```

Proceed with conversion (Y or N):

If you select **N**, WPSCONV asks you if you want to convert the same file.

If you select **Y**, WPSCONV converts the document and replies:

```
This document has been converted.
Press Return to continue or Cancel to return to
menu.
```

Press **<RET>** to see WPSCONV display the name of the next document. Press **F8**, the CANCEL key, to return to the WPSCONV menu.

- If you select **Y**, WPSCONV replies:

```
Converting
  DriveNumber. DocumentName
    to DriveLetter:FileName.FileType
```

Proceed with conversion (Y or N):

If you select **N**, WPSCONV asks you if you want to convert the same file.

If you select **Y**, to convert the file, WPSCONV converts the document and replies:

```
This document has been converted.
Press Return to continue or Cancel to return to
menu.
```

Press **<RET>** to see WPSCONV display the name of the next document. Press **F8**, the CANCEL key, to return to the WPSCONV command menu.

WPSCONV displays all the documents in the WPS document diskette index, one by one. After the last document, WPSCONV replies:

Selected documents have been transferred
Press Return or Cancel to return to menu.

Press either **<RET>** or **F8**, the CANCEL key to return to the WPSCONV menu.

Leaving WPSCONV

When you select **EX** from the WPSCONV command menu, the system displays the CP/M prompt at the bottom of the screen. You are now back in the CP/M operating system.

WPSCONV Error Messages

Invalid command entered
Press Return or Cancel to continue

You entered a command letter other than one of the choices presented on the WPSCONV command menu. Press either **<RET>** or **F8**, the CANCEL key, to return to the WPSCONV command menu and make another selection.

Drive X does not contain a valid WPS diskette
Press Return to continue or Cancel to return to menu

Either the diskette in the named drive (drive X) is not a valid WPS diskette, the drive is empty, the drive door is open, or WPSCONV cannot read the diskette in drive X. Press **<RET>** to select another drive, or press **F8**, the CANCEL key, to return to the WPSCONV command menu.

Error accessing WPS diskette
Press Return or Cancel to return to menu

WPSCONV cannot read from the WPS diskette. You cannot correct this error. Press either **<RET>** or **F8**, the CANCEL key, to return to the WPSCONV command menu.

Diskette index is empty
Press Return or Cancel to return to menu

You tried to view the index of a WPS diskette that contains no documents.
Press either <RET> or F8, the CANCEL key, to return to the WPSCONV command menu.

Error accessing WPS index
Press Return or Cancel to return to menu

WPSCONV cannot read the index document of the WPS diskette. You cannot correct this error. Press either <RET> or F8, the CANCEL key, to return to the WPSCONV command menu.

Document disk is full
Press Return or Cancel to return to menu

Your WPS diskette already contains 200 documents. You cannot add more documents to this diskette or correct this error. Press either <RET> or F8, the CANCEL key, to return to the WPSCONV command menu.

Error creating WPS document
Press Return or Cancel to return to menu

WPSCONV did not create the WPS document correctly. You cannot correct this error. Press either <RET> or F8, the CANCEL key, to return to the WPSCONV command menu.

Error writing WPS document
Press Return or Cancel to return to menu

WPSCONV did not write the document on the WPS diskette correctly. You cannot correct this error. Press either <RET> or F8, the CANCEL key, to return to the WPSCONV command menu.

Error filing WPS document
Press Return or Cancel to return to menu

WPSCONV did not file the document on the WPS diskette correctly. You cannot correct this error. Press either <RET> or F8, the CANCEL key, to return to the WPSCONV command menu.

Error updating WPS index
Press Return or Cancel to return to menu

WPSCONV made an error while adding the document name to the WPS index. The newly-created document is filed, but it can only be accessed by document number. You cannot correct this error. Press either <RET> or F8, the CANCEL key, to return to the WPSCONV command menu, and use the DI command to identify the proper document number.

Error writing allocation block
Press Return or Cancel to return to menu

WPSCONV made a write error while processing either the allocation or name block. The diskette you were writing to may be unusable and should be verified immediately. Press either <RET> or F8, the CANCEL key, to return to the WPSCONV command menu and exit from WPSCONV. Change to the WPS system diskette and verify the diskette immediately.

File not found
Press Return to continue or Cancel to return to menu

The CP/M file you tried to convert does not exist. Press <RET> to select another file or press F8, the CANCEL key, to return to the WPSCONV command menu.

Error opening CP/M file
Press Return to continue or Cancel to return to menu

WPSCONV made an error while opening the CP/M file. Press <RET> to select another file or press F8, the CANCEL key, to return to the WPSCONV command menu.

Invalid index document
Press Return or Cancel to return to menu

The index document on the WPS diskette is incorrectly formatted and cannot be processed. You cannot correct this error. Press either <RET> or F8, the CANCEL key, to return to the WPSCONV command menu.

Error reading WPS index
Press Return or Cancel to return to menu

WPSCONV made an error while reading the WPS diskette index. You cannot recover from this error. Press either <RET> or F8, the CANCEL key, to return to the WPSCONV command menu.

Invalid drive entered

Press Return to continue or Cancel to return to menu

The drive number or letter you typed was not a legal drive (A through H or 0 through 7). Press <RET> to select another drive or press F8, the CANCEL key, to return to the WPSCONV command menu.

Input and output drives are identical

The drive names you entered for the WPS and CP/M diskettes are identical. Press <RET> to re-enter the second drive name and continue or press F8, the CANCEL key, to return to the WPSCONV command menu.

Error while overwriting file

WPSCONV made an error while overwriting the output file or document. You cannot recover from this error. Press either <RET> or F8, the CANCEL key, to return to the WPSCONV command menu.

6

Utility Programs for Hard Disk Users

This chapter contains information on the CP/M utility programs for the RD51 hard disk subsystem. Each utility program description is followed by a list of the error messages that may occur while you are using the utility. Each error message is explained, and the action you should take is discussed.

You may use these utility programs if you have done all of the following:

- Installed an RD51 hard disk subsystem in your DECmate II system
- Formatted the hard disk
- Either installed a CP/M system volume on the hard disk or created an alternate type system diskette
- Started the CP/M operating system and have the CP/M prompt on the screen

HD – The Hard Disk Utilities Program

The HD command runs HD.COM, the hard disk utilities program. HD is a collection of support utilities for the DECmate II RD51 hard disk subsystem.

If your DECmate II system is equipped with an RD51 hard disk, you can use the HD utilities program to:

- Mount and dismount volumes
- View the names of mounted volumes
- List the names of all volumes
- Allocate new volumes
- Erase existing volumes
- Back up and restore existing volumes (using RX50 diskettes)
- Rename an existing volume
- Mark a system volume as the startup volume
- Remove the modified designation from a volume

Run the HD utility program by typing:

```
E> HD<RET>
```

The system responds with the first page of a two-page menu. Both pages are shown in Screens 65 and 66. Press the NEXT SCREEN key to move from one page of the menu to the other.

You can make a menu selection in two ways:

- Type the tag, the letter associated with the menu option you want to use, then press the DO key.
- Use the UP ARROW and DOWN ARROW keys to move the highlight to the option you want to use, then press the DO key.

If an HD option is waiting for you to enter data and you decide to cancel the operation, press F8, the CANCEL key. This returns you to the first page of the menu.

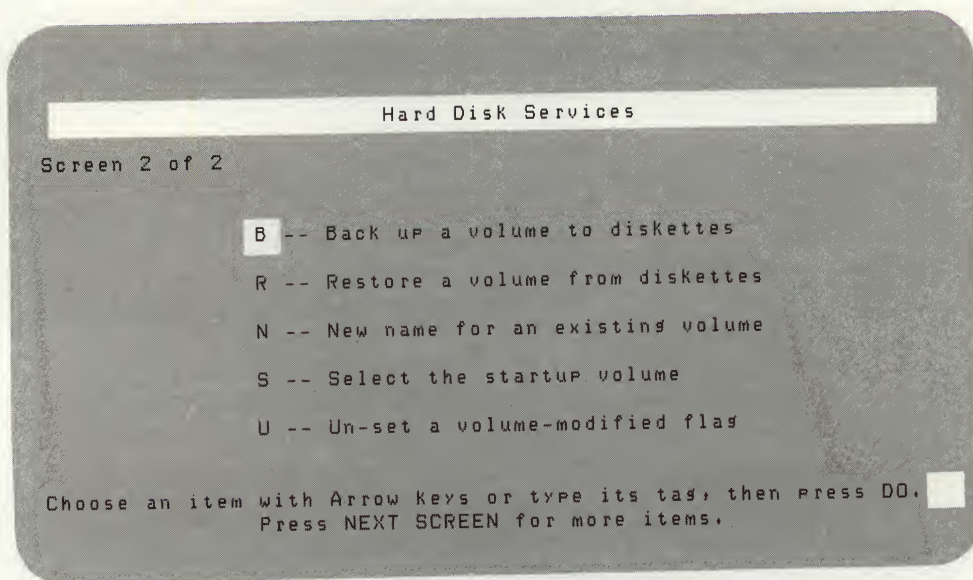
Hard Disk Services

Screen 1 of 2

- V -- View which volumes are mounted
- M -- Mount a volume
- D -- Dismount a volume
- L -- List directory of volumes
- A -- Allocate a new volume
- E -- Erase an existing volume
- Q -- Quit this Program

Choose an item with Arrow keys or type its tag, then press DO.
Press NEXT SCREEN for more items.

Screen 65



Screen 66

Viewing Mounted Volumes

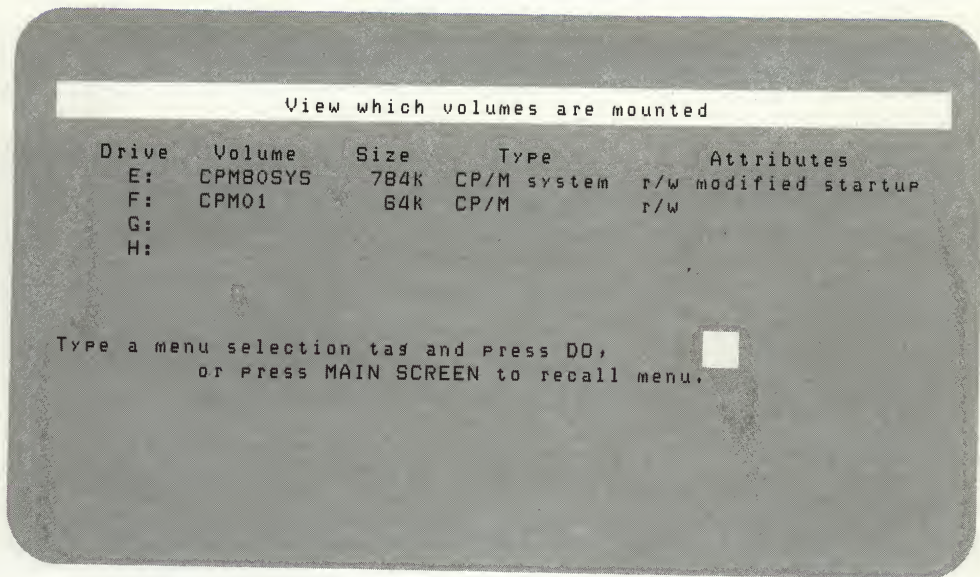
When you select **V**, the system displays the names of all currently mounted volumes and statistics about them, as shown in Screen 67.

The **Drive** field always lists the four drives available on a hard disk subsystem: E:, F:, G:, and H:.

The **Volume** field states the name of the volume mounted on each drive. If this field is blank, there is no volume mounted on the drive.

The **Size** field lists the size of each mounted volume in K bytes (one K byte equals 1024 bytes).

The **Type** field classifies the volume. The first entry in this field lists the name of the operating system (such as CP/M) that was associated with the volume when it was created. If the word **system** follows the operating system name, the volume contains a copy of the named operating system. If system is not listed, the volume is a data volume.



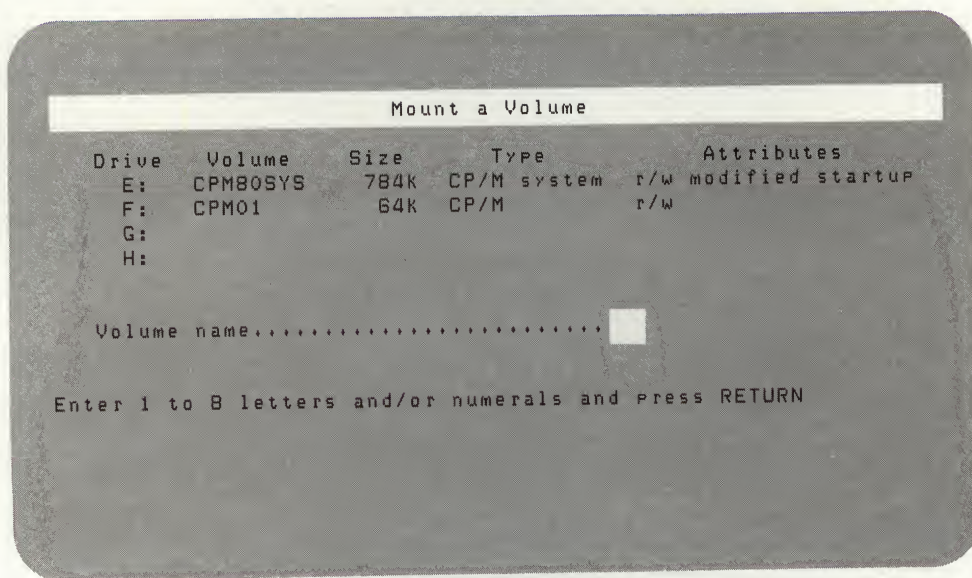
Screen 67

The **Attributes** field describes the distinctive features of each volume. You can both read from the volume and write to it if r/w appears in this field. You can only read from the volume if r/o appears in the field. The word **modified** indicates that the volume has been modified since you created it, backed it up, or reset the volume modified flag. The word **startup** indicates that the volume is the startup volume. That is, when you cold start your DECmate II system without specifying a volume name, the system starts from the startup volume. You may have only one startup volume on the hard disk at a time.

If you want to make another choice from the menu, and you know the tag (letter) that represents your choice, enter the tag and press the DO key. If you want to return to the menu, press F9, the MAIN SCREEN key.

Mounting Volumes

When you select **M**, the system responds with a display similar to the display shown in Screen 68.



Screen 68

The area at the top of the screen lists the four hard disk drives and displays information about each one. This is the same display you see when you use the View option.

Enter the name of the volume you want to mount and press **<RET>**. The system then asks:

Mount on which drive [E,F,G,H].....

Type the letter of the drive you want the volume mounted on and press **<RET>**. The system asks:

Read-only or read-write [R,W].....

If you want to read from the volume and not write on it, choose R. If you want to read from the volume and write on it, choose W. Type the letter that represents your choice and press **<RET>**. The system replies:

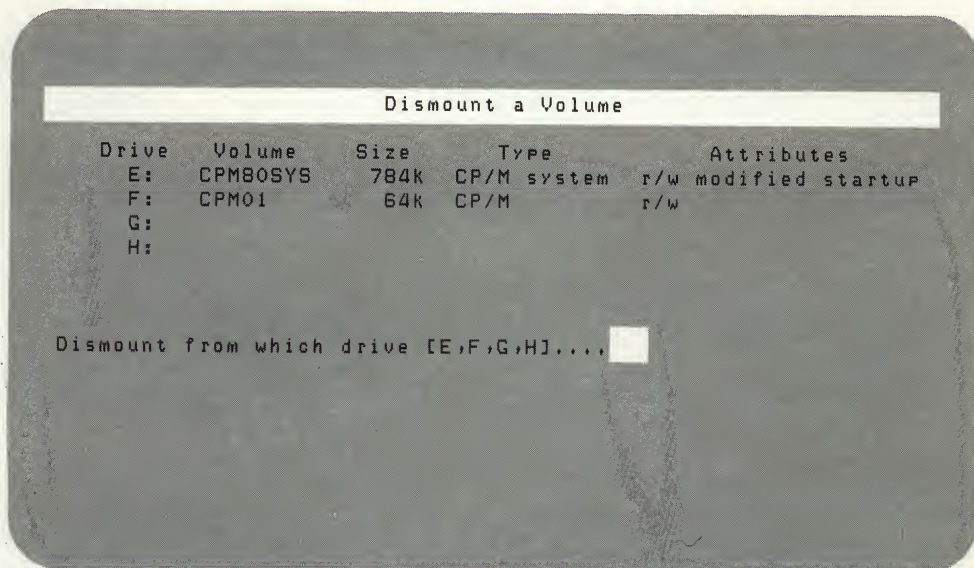
Volume mounted

Type a menu selection tag and Press DO,
or Press MAIN SCREEN to recall menu.

If you want to make another choice from the menu, and you know the tag (letter) that represents your choice, enter the tag and press the **DO** key. If you want to return to the menu, press **F9**, the MAIN SCREEN key.

Dismounting Volumes

When you select **D**, the system responds with a display similar to the display shown in Screen 69.



Screen 69

The area at the top of the screen lists the four hard disk drives and displays information about each one. This is the same display you see when you use the View option.

Enter the letter of the drive which contains the volume you want to dismount and press **<RET>**

For example, to dismount CPM01 from drive F, type **F** and press **<RET>**. The system replies:

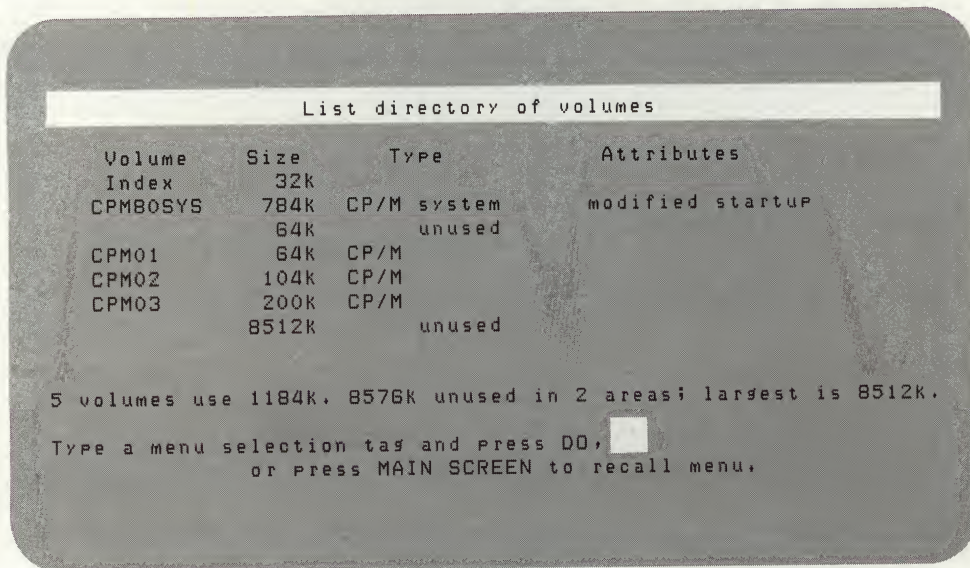
```
Volume CPM01 dismounted
```

```
Type a menu selection letter and Press DO,  
or Press MAIN SCREEN to recall menu.
```

If you want to make another choice from the menu, and you know the tag (letter) that represents your choice, enter the tag and press the **DO** key. If you want to return to the menu, press **F9**, the MAIN SCREEN key.

Listing the Directory of Volumes

When you select **L**, the system displays a list of all the volumes and unused areas on your hard disk system as shown in screen 70.



Screen 70

The **Volume** field lists the names of all volumes that have been allocated on the hard disk. The volume named Index is always listed first and never has a type or attributes. This area on the disk contains the information that the DECmate II system needs to access data on the hard disk. You cannot access this volume. You can have up to 60 volumes (this includes the Index volume and all the unused areas) on your directory. You can mount only four volumes at any one time.

The **Size** field lists the size of each volume in K bytes (one K byte is 1024 bytes).

The **Type** field classifies the volume. The first entry in this field lists the name of the operating system (such as CP/M) that was associated with the volume when it was created. If the word **system** follows the operating system name, the volume contains a copy of the named operating system. If system is not listed, the volume is a data volume. If the word **unused** appears in the type field, this area on the hard disk is currently unused and is not a part of any volume.

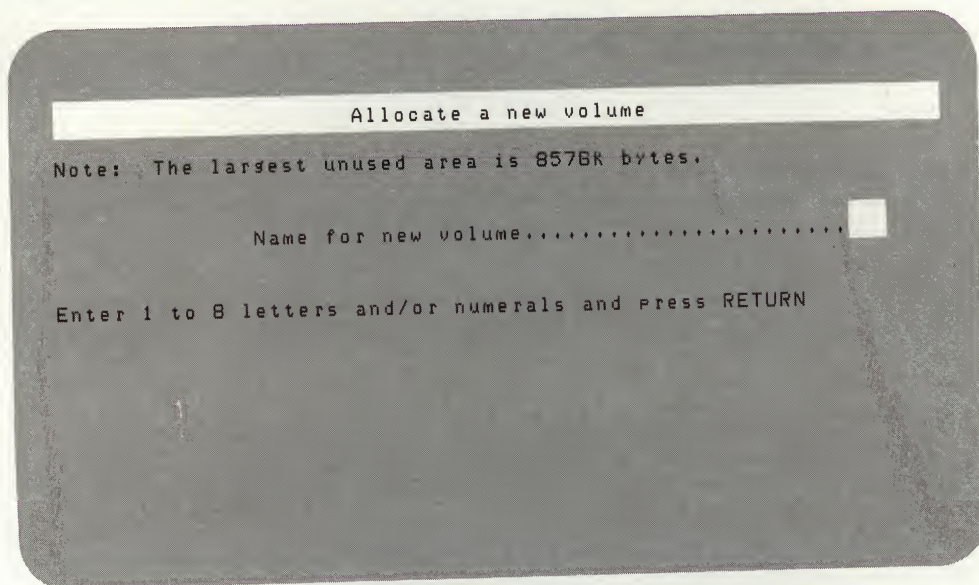
The **Attributes** field describes the distinctive features of each volume. The word **modified** indicates that the volume has been modified since you created it, backed it up, or reset the volume modified flag. The word **startup** indicates that the volume is the startup volume. That is, when you cold start your DECmate II system without specifying a volume name, the system starts from the startup volume. You may have only one startup volume on the hard disk at one time.

At the bottom of the screen the system displays the number of volumes on your hard disk and the total amount of space that they occupy. This is followed by the total amount of unused area, the number of unused areas, and the size of the largest unused area. Because each volume must reside in a single area of contiguous space on the hard disk, the size of the largest unused area determines the size of the largest volume you can create.

If you want to make another choice from the menu, and you know the tag (letter) that represents your choice, enter the tag and press the DO key. If you want to return to the menu, press F9, the MAIN SCREEN key.

Allocating a New Volume

When you select **A**, the system responds with a display similar to the display shown in Screen 71.



Screen 71

Use this option to create data volumes on your hard disk. You may not use it to create system volumes. (System volumes can only be created with the installation diskette.)

The note at the top of the screen lists the largest area of unused space available on the hard disk. Since a volume always consists of contiguous space on the disk, this number is the maximum size for your new volume.

Enter the name of the volume you are creating and press <RET>. Volume names must be from one to eight characters in length. Legal characters include the letters A to Z and the numerals 0 to 9. The system then displays:

Usage..... CP/M

Size (in K bytes).....

Enter a number between 64 and XXXX.

It will be rounded up to a multiple of 8.

Usage means that the volume you are creating is associated with the CP/M operating system. XXXX is the size of the largest free area on the hard disk. 8192 K bytes is the maximum value for this number.

Enter the size of your new volume and press <RET>. The system prints on the screen:

Press DO to allocate or CANCEL to recall menu instead

If you want to create the volume, press the DO key. If you want to cancel the command and return to the menu without creating the volume, press the F8, the CANCEL key.

After a few moments, the system displays:

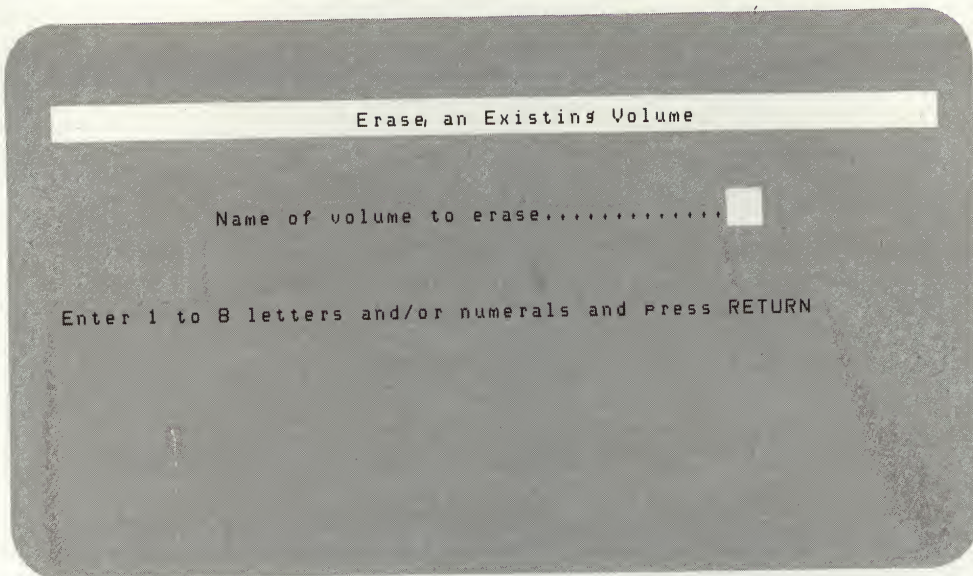
New volume allocated and CP/M directory initialized

Type a menu selection tag and Press DO,
or Press MAIN SCREEN to recall menu.

If you want to make another choice from the menu, and you know the tag (letter) that represents your choice, enter the tag and press the DO key. If you want to return to the menu, press F9, the MAIN SCREEN key.

Erasing an Existing Volume

When you select **E**, the system responds with the display shown in Screen 72.



Screen 72

Use this option to remove a volume from the hard disk and delete its contents.

Enter the name of the volume you want to erase and press **<RET>**. The system displays the following message:

```
WARNING
  This erases the volume from the hard disk
    and discards the entire contents of the volume.
  Press DO only if you are sure you don't need them.
```

Press **DO** to erase volume or **CANCEL** to recall menu instead

If you press **F9**, the **CANCEL** key, the volume is not erased and the menu is redisplayed.

If you press **DO**, the system erases the named volume and prints the following message:

Volume erased

Type a menu selection tag and Press **DO**,
or Press **MAIN SCREEN** to recall menu.

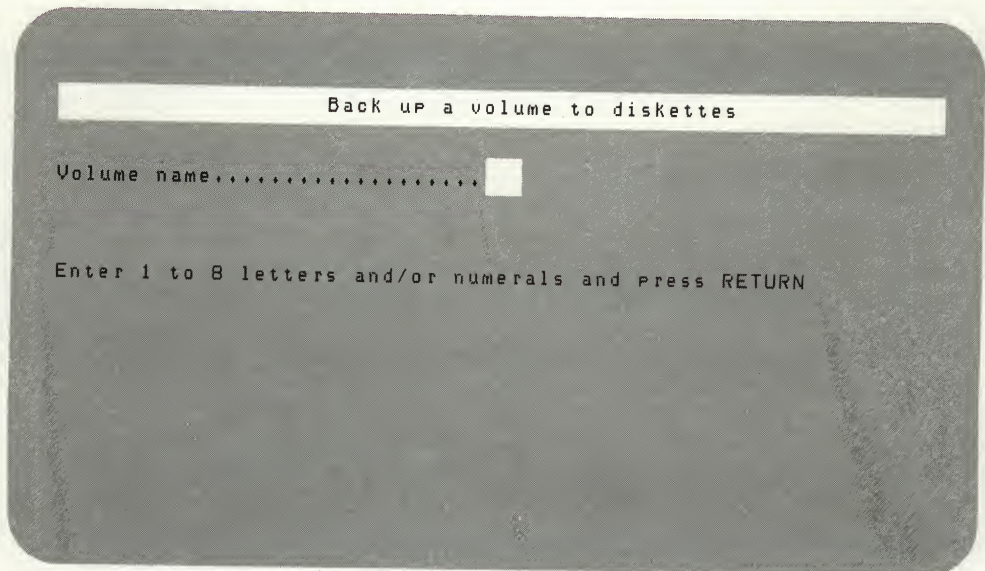
If you want to make another choice from the menu, and you know the tag (letter) that represents your choice, enter the tag and press the **DO** key. If you want to return to the menu, press **F9**, the **MAIN SCREEN** key.

Quitting the HD Program

When you select **Q**, you leave the HD utility and return to operating system control. You see the CP/M prompt at the top, left corner of the screen.

Backing up a Volume

When you select **B**, the system responds with the display shown in Screen 73.



Back up a volume to diskettes

Volume name.....

Enter 1 to 8 letters and/or numerals and Press RETURN

Screen 73

The diskettes you create using the Back Up option can only be used by the Restore option to restore the volume. When you backup a volume, Back Up un-sets the volume-modified flag.

Enter the name of the volume you want to back up and press **<RET>**. The system replies:

Today's date.....

Enter date as MM/DD/YY

Enter the date in the form indicated on the screen (leading zeroes are required). Then press **<RET>**. The system asks:

Time.....

Enter time as HH:MM

Enter the time in the form indicated on the screen (leading zeroes are required). Then press **<RET>**. The system asks:

Remarks...

Enter a note to yourself about the volume you are backing up and press **<RET>**. This note is displayed on the screen when you restore the volume. The system replies:

X diskettes are required for the backup copy.

Insert a blank diskette in drive 1 (drive B:)
Press DO when diskette is ready or CANCEL to recall menu instead

Back Up calculates the number of diskettes required to back up your hard disk volume. Back Up stores up to 392k bytes of information on each diskette.

Have the required number of diskettes ready. Insert the first diskette into drive B, close the drive door, and press the **DO** key. The system displays:

Writing diskette 1 of X

X is the number of diskettes required to back up the volume. This message is followed by a row of dots proportional to the amount of data Back Up has to copy onto the diskette in drive B.

As the copying process proceeds, one by one the dots change to asterisks. If another diskette is required, the system displays:

Diskette 1 completed. Remove and label it.

Remove the diskette from drive B and label it. Insert another diskette into drive B and press the **DO** key.

Repeat this process until you have backed up the entire volume. When the back up procedure has successfully completed, the system displays this message:

Diskette X completed. Remove and label it.

Back up completed successfully. Volume modified flag has been reset.

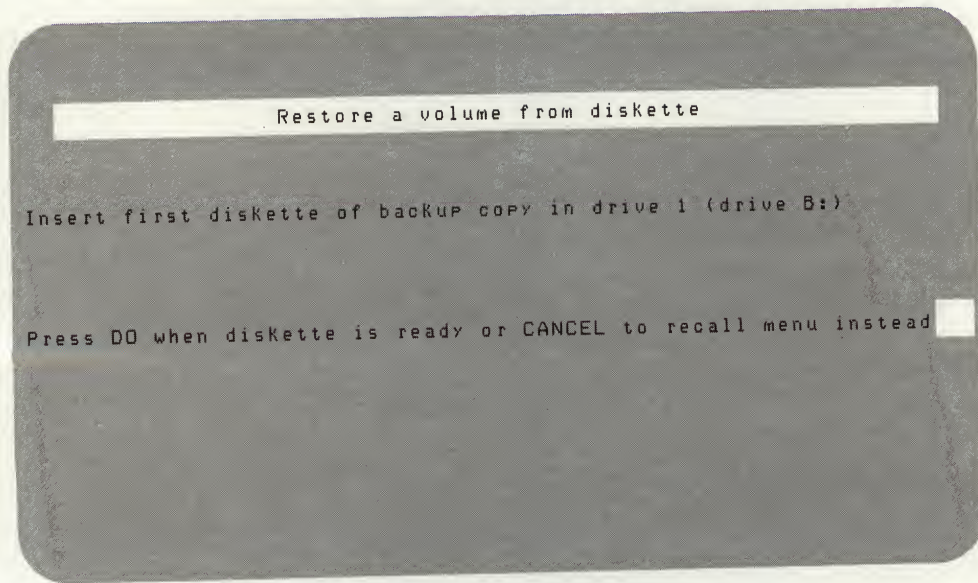
Type a menu tag and Press **DO**,
or Press **MAIN SCREEN** to recall menu.

Remove the last diskette from drive B and label it. Store all the Back Up diskettes in their protective envelopes in a safe place until you are ready to restore the volume.

If you want to make another choice from the menu, and you know the tag (letter) that represents your choice, enter the tag and press the **DO** key. If you want to return to the menu, press **F9**, the **MAIN SCREEN** key.

Restoring a Volume

When you select **R**, the system responds with the display shown in Screen 74.



Screen 74

Have the diskette (or diskettes) that you used to back up the volume ready, insert the first diskette into drive B, and press the **DO** key. The system displays information about the backup diskette in drive B and the following message:

Press DO to continue or CANCEL to recall menu instead

Press the **DO** key to restore the volume. The system asks:

Do you wish to restore with a different volume name [Y,N]?

If you want the restored volume to have a different name type Y and press <RET>. If you want to use the same name for the volume, type N and press <RET>.

- If you select **Y**, the system asks you:

Enter name to use for restored volume....

Enter a one- to eight-character name for the restored volume and press **<RET>**. The system then allocates the volume and displays the message:

Reading diskette 1 of X

X is the number of diskettes containing the contents of the volume you are backing up. This message is followed by a row of dots proportional to the amount of material on the diskette. As the information is copied onto the hard disk volume, one by one, the dots change to asterisks.

If there is more than one diskette, Restore prompts you to insert the remaining diskettes. When the restore process is complete, the system displays the following message:

Restoration completed successfully.

Type a menu selection tag and Press DO,
or Press MAIN SCREEN to recall menu.

- If you select **N**, the system first checks to see if the volume name is currently being used on the hard disk.

If a volume by that name currently exists, you will see an error message. Press **<RET>** to try another name.

If a volume by that name does not currently exist, The system allocates the volume and displays the message:

Reading diskette 1 of X

X is the number of diskettes which contain the contents of the volume you are backing up. This message is followed by a row of dots proportional to the amount of material on the diskette. As the information is copied onto the hard disk volume, one by one, the dots change to asterisks.

If there is more than one diskette, Restore prompts you to insert the remaining diskettes. When the restore process is complete, the system displays the following message:

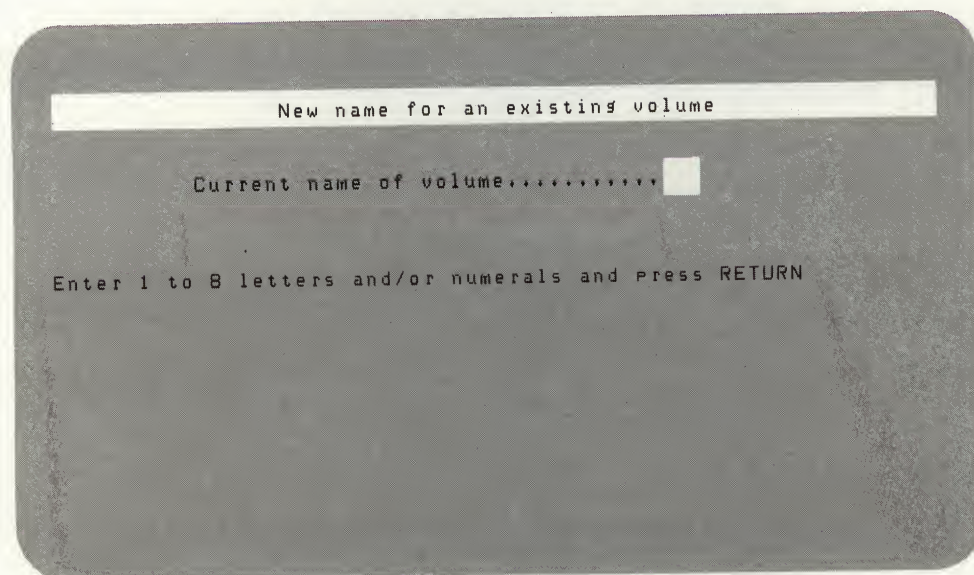
Restoration completed successfully.

Type a menu selection tag and Press DO,
or Press MAIN SCREEN to recall menu.

If you want to make another choice from the menu, and you know the tag (letter) that represents your choice, enter the tag and press the **DO** key. If you want to return to the menu, press **F9**, the **MAIN SCREEN** key.

Renaming an Existing Volume

When you select **N**, the system responds with the display shown in Screen 75.



Screen 75

The New name option allows you to rename an existing volume on the hard disk.

Enter the present name of the volume and press **<RET>**. The system asks:

New name for volume.....

Enter 1 to 8 letters and/or numerals and Press RETURN

Enter the new name of the volume and press <RET>. The system displays:

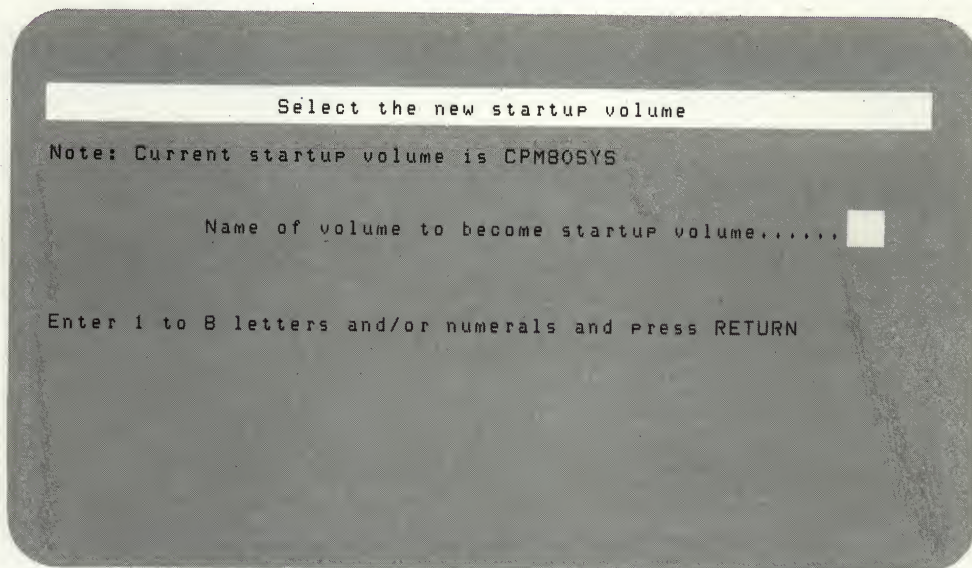
Volume renamed

Type a menu selection tag and press DO,
or press MAIN SCREEN to recall menu.

If you want to make another selection from the menu, and you know the tag (letter) that represents your choice, enter the tag and press the DO key. If you want to return to the menu, press F9, the MAIN SCREEN key.

Selecting the Startup Volume

When you select S, the system responds with a display similar to the display shown in Screen 76.



Select the new startup volume

Note: Current startup volume is CPMBOSYS

Name of volume to become startup volume.....

Enter 1 to 8 letters and/or numerals and press RETURN

Screen 76

The system displays the name of the current startup volume at the top of the screen and then asks you for the name of the volume that you want to designate as the startup volume. Enter the name of the new startup volume and press **<RET>**. The system displays:

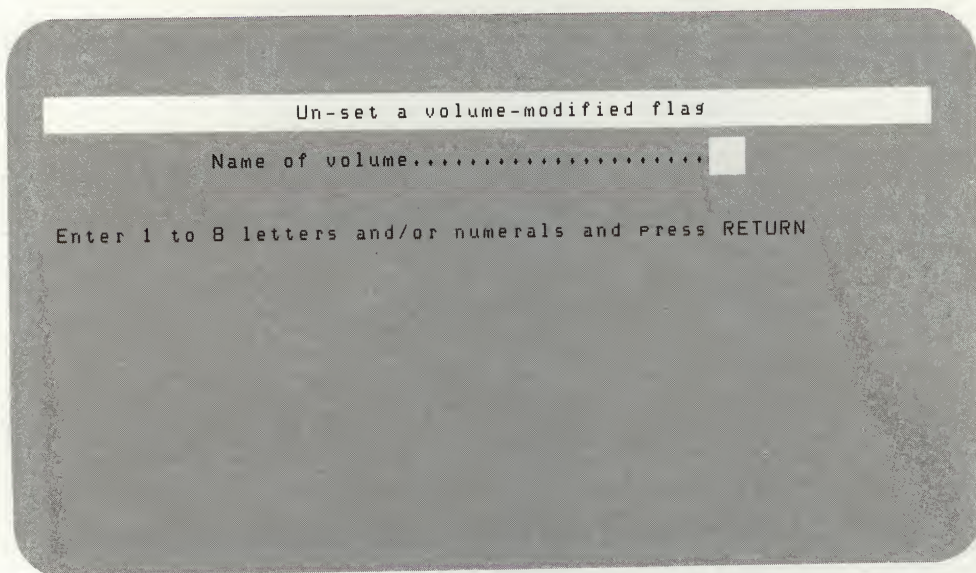
```
Volume marked as startup volume
```

```
Type a menu selection tag and Press DO,  
or Press MAIN SCREEN to recall menu.
```

If you want to make another choice from the menu, and you know the tag (letter) that represents your choice, enter the letter and press the **DO** key. If you want to return to the menu, press **F9**, the MAIN SCREEN key.

Removing a Volume-Modified Flag

When you select **U**, the system responds with the display shown in Screen 77:



Screen 77

Use this command to remove (Un-set) a volume-modified flag. This command manually removes the modified designation from the list of attributes for the volume you name. This command assists you in keeping track of which of your volumes require backing up.

The volume-modified flag is automatically reset when you back up a volume using the Back Up option.

Enter the name of the volume whose volume-modified flag you want to reset. Then press <RET>. The system displays:

```
Volume-modified flag reset
```

```
Type a menu selection tag and press DO,  
or Press MAIN SCREEN to recall menu
```

If you want to make another choice from the menu, and you know the tag (letter) that represents your choice, enter the tag and press the DO key. If you want to return to the menu, press F9, the MAIN SCREEN key.

HD Error Messages

```
No volume is mounted on this device
```

You tried to dismount a volume from a drive that did not have a volume mounted on it. Press <RET> to try another drive designation. Or, use the Verify option to see which drive contains the volume you want to dismount.

```
Size of XXXX is too large
```

When allocating a volume, you entered a volume size, XXXX, that was larger than the largest area available on the hard disk. Press <RET> to try a smaller volume size.

```
Size of XX is too small
```

When allocating a volume, you entered a volume size, XX, that was smaller than the minimum size for a data volume. For the CPM operating system, the minimum size for a data volume is 64 K bytes. Press <RET> to enter another volume size.

This machine does not have a hard disk

You used an alternate type system diskette and tried to access a hard disk drive on a DECmate II system which does not have a hard disk subsystem installed.

Volume already mounted

You tried to mount a volume which is already mounted on another drive. You cannot mount the same volume on more than one drive at the same time. Press **<RET>** to try another volume name.

Volume name already used on disk

You have attempted to use a volume name that is already used on the hard disk. You must select another name since two volumes on the hard disk cannot have the same name. Press **<RET>** to try another name.

Volume XXXXXX not found on disk

You have asked one of the HD command options to find a volume, named XXXXXX, which does not exist on the hard disk. For example, you may have misspelled the name of the volume that you wanted to rename or erase. Use the List option to check the spelling of the names of the volumes on the hard disk. Press **<RET>** to try another name.

You cannot Quit this program unless a
CP/M volume is mounted on drive E:

You tried to exit from the HD utilities program after dismounting the volume from drive E. First, use the Mount option to mount a CP/M volume on drive E. Then you will be able to leave the HD program.

BOOT

The Boot command runs BOOT.COM, a utility program that starts a DECmate II hard disk system from the designated hard disk system volume. This utility "boots" your hard disk system; that is, it performs a cold start operation. The BOOT utility program works with the other DECmate II operating systems besides CP/M (COS-310, for example).

BOOT mounts the system volume on the hard disk default drive, usually E, and displays the CP/M prompt. It dismounts all the volumes that are mounted when the command is given.

You cannot use this utility to switch to or from RX50 diskette-based operation (use the SET-UP key to do this).

Run the BOOT utility by giving the BOOT command. You can issue the BOOT command in two ways—with or without the name of a system volume to mount. If you do not name a volume, BOOT mounts the designated startup volume. See the HD (hard disk utility program) List option for an explanation of this term. If you do name a system volume, BOOT mounts that volume.

To perform a cold start with a particular system volume, give the BOOT command followed by a space and the name of the system volume. For example typing:

```
E> BOOT CPMSYS05<RET>
```

cold starts the DECmate II system and mounts the CP/M system volume named CPMSYS05 on hard disk drive E. Any volumes that were mounted when the command was issued are dismounted.

To perform a cold start with the system startup volume, type:

```
E> BOOT<RET>
```

This command cold starts the DECmate II system and mounts the designated startup volume on drive E. Any volumes that were mounted when the command was issued are dismounted.

Examples Using the BOOT command

To cold start the system and mount CPM80SYS, the startup volume, type:

```
E> BOOT<RET>
```

The system replies:

```
Mounting the startup volume
```

```
Volume CPM80SYS mounted on device 0
```

This is followed by the CP/M startup messages, banner, and prompt E>.

To cold start the system and mount a CP/M system volume, CPMSYS05, when the current CP/M startup volume, BIGCPM, is mounted on drive E, type:

```
E> BOOT CPMSYS05<RET>
```

The system replies:

```
CPMSYS05 mounted on device 0
```

and displays the CP/M startup messages, banner, and E> prompt.

BOOT Error Messages

```
Current system loaded from diskette; cannot  
use BOOT. Use SETUP key instead.
```

You used an alternate type system diskette to start your system. Then, you tried to use BOOT to start a hard disk system volume. Use the SET-UP key to change between hard disk volume and diskette-based operation.

```
This machine does not have a hard disk.
```

You used an alternate type system diskette to start a DECmate II system which does not have a hard disk and tried to use the BOOT command.

```
Volume XXXX is not a bootable system volume
```

The volume, XXXX, that you named in the BOOT command is not a system volume. Retype the command with the name of a system volume.

```
Volume XXXX not found on hard disk
```

The volume, XXXX, that you named in the BOOT command does not exist on the hard disk. Press <RET> and retype the command with a correct volume name.

DISMOUNT

The DISMOUNT command runs DISMOUNT.COM, a utility program that dismounts hard disk volumes.

It performs the same function as the HD utility Dismount option, but it has the following advantages:

- You can easily dismount a volume if you know which drive the volume is currently mounted on. The one-line DISMOUNT command replaces the several steps required to dismount the volume using the HD utility Dismount option.
- You can issue the DISMOUNT command from a SUBMIT file. See the discussion of the SUBMIT command in Chapter 3 for more information.

Run the DISMOUNT utility by giving the DISMOUNT command. To do this, type DISMOUNT, a space, the letter of the drive that contains the volume, and a colon. Terminate the command by pressing <RET>.

Examples Using the DISMOUNT Command

To dismount the volume CPM05 from drive G, type:

```
E>DISMOUNT G:<RET>
```

The system replies:

```
Volume CPM05 dismounted from drive G:
```

```
E>
```

To dismount the volume CPM05 from drive F after you change the CP/M default drive from E to F, type:

```
F>DISMOUNT F:<RET>
```

The system replies:

```
Volume CPM05 dismounted from drive F:  
CP/M default drive changed to E:
```

```
E>
```

The system dismounts the volume as you requested and returns the default drive designation to drive E.

DISMOUNT Error Messages

Cannot dismount system residence volume from drive E

You cannot dismount the system volume from drive E. You can, however, replace the system volume on drive E by mounting a new system volume over the current system volume. (See the example in the MOUNT command section.)

Missing or incorrect drive letter
The command must include one of E:, F:, G:, or H:

You either excluded the drive designation from the DISMOUNT command or you entered an improper drive designation such as A:. Retype the command and press <RET>.

No volume is mounted on drive X

You issued a DISMOUNT command for a drive, drive X, that did not have a volume mounted on it. Use the HD utility Verify option to see a list of drives and the volumes mounted on them. Then retype the command and press <RET>.

This machine does not have a hard disk.

You used an alternate type system diskette to start a DECmate II system which does not have a hard disk and tried to use the DISMOUNT command.

MOUNT

The MOUNT command runs MOUNT.COM, a utility program that mounts hard disk volumes.

MOUNT performs the same function as the HD utility Mount option with one exception: it always mounts volumes with the r/w attribute. That is, you will always be able to read from and write to any volume you mount with this utility. MOUNT has the following advantages:

- You can easily mount a volume if you know the volume name and the drive you want to mount it on. The one-line MOUNT command replaces the several steps required to mount the volume using the HD utility Mount option.

- You can issue a MOUNT command from a SUBMIT file. See the discussion of the SUBMIT command in Chapter 3 for more information.

Run the MOUNT utility by giving the MOUNT command. To do this, type MOUNT, a space, the letter of the drive you want to mount the volume on, followed by a colon, and finally, the name of the volume you want to mount.

Examples Using the MOUNT Command

To mount the volume CPM04 on drive G, type:

```
E>MOUNT G:CPM04<RET>
```

The system replies:

```
Volume CPM04 mounted on drive G:
```

```
E>
```

To mount the volume BIGCPM on drive F when the volume CPM05 is already mounted on drive F, type:

```
E> MOUNT F:BIGCPM<RET>
```

The system replies:

```
Volume CPM05 dismounted from drive F
```

```
Volume BIGCPM mounted on drive F
```

```
E>
```

MOUNT Error Messages

Missing or incorrect drive letter

The command must include one of E:, F:, G:, or H:

You either excluded the drive designation, entered an improper drive designation, such as A:, or entered the drive designation and volume name out of order. Retype the command using the examples and instructions above.

No volume name found in command

You entered a MOUNT command with a drive designation but you forgot to include a volume name. Retype the command following the examples and instructions above.

This machine does not have a hard disk.

You used an alternate type system diskette to start a DECmate II system which does not have a hard disk and tried to use the MOUNT command.

Volume XXXXX not found on hard disk

You entered a MOUNT command for a volume, XXXXX, which does not exist on the hard disk. You may have misspelled the name of the volume. Press **<RET>** to try another name.

Volume XXXXX is already mounted on drive Y

You entered a MOUNT command for a volume, XXXXX, which is already mounted. Y names the drive that XXXXX is mounted on.

What to Do in Case of Trouble

What Trouble Is

For a computer user, trouble is any behavior on the part of the computer that does not conform to the user's expectations. Trouble can be caused by any of the following:

- An electronic component fails
- An essential connection breaks
- A program contains undetected bugs
- A file copy is corrupted
- The user asks the computer to do inappropriate or impossible operations

The most probable source of all is the last: that is, user error.

From this fact follows the first rule of troubleshooting. When trouble occurs, double check to make sure you did not cause it. If an operation seems to fail, reread the documentation covering that operation to make sure you have not skipped a step. Then try the operation again, carefully checking each step to make sure you use all required commands, arguments, and references.

When you are sure that your command or commands are not at fault, think about the trouble symptoms, and see if you can reason out an explanation. If, for example, you suddenly begin having trouble with an applications program that seemed to work properly on a previous occasion, recopy the program from your master diskette and try again. Flexible diskettes are physically and magnetically fragile. A crease in the diskette sheath or a dent or a fingerprint on the diskette surface is all it takes to ruin the diskette.

How to Get Help

In general, we can break DECmate II system troubles down into two categories:

- 1 Troubles that you can find and eliminate on your own.
- 2 Troubles that require assistance from one or more of the vendors from whom you bought your hardware and software system components.

The vendor you go to for help depends on whether the problem is software or hardware related. You must decide which party to contact in any given case of trouble.

If you have hardware problems, contact either your DECmate II vendor or, if you have an appropriate contract, your DIGITAL Field Service representative.

If you have software problems, contact the vendor who gave you the applications program that is giving you trouble.

If you cannot successfully copy or load a new applications program, then you have received it either in a corrupted state or in the wrong format. In either case, return it to the vendor for replacement.

If a new applications program loads and runs properly up to a point and then fails, it may be expecting a device that you do not have (a printer, for example)—or you may need to redefine a logical device. If none of these explanations fit, there are two possibilities—you have a bug in the applications program, or your version of CP/M and the applications program are incompatible. In either case, contact the applications program vendor for advice. The chances are good that other users have already had the same problem, and the vendor can tell you immediately how to fix it.

The chances are very small that you will find an undetected bug in the CP/M operating system itself. CP/M is one of the most heavily used operating systems in the world today. As a result, most of its bugs have been found and corrected. Nevertheless, if CP/M repeatedly behaves in ways contrary to the definitions and examples in this book—and if you cannot correct these peculiarities by recopying your master system diskette—contact your DECmate II vendor or DIGITAL Field Service representative.

Some Common Trouble Symptoms and Their Cures

No Prompt

When you start the system, you should get startup messages (described in Chapter 1 and on the *CP/M Getting Started Card* for your system) followed by the CP/M prompt. If you have a diskette system and the prompt never appears, and characters do not show up on the screen when you type them, make sure that:

- The system diskette is in the specified drive (usually drive A).
- The system diskette is in the right way, with the label upward and toward the front.
- The drive door is closed.

Freezing

If CP/M or an applications program suddenly seems to go dead, or if the characters you type suddenly stop appearing on the screen, you may have accidentally pressed the HOLD SCREEN key or <CTRL/S>. If the HOLD SCREEN light at the top of the keyboard is on, press the HOLD SCREEN key again to unfreeze the screen. If the HOLD SCREEN light is not on, press <CTRL/Q>.

The Display Screen Goes Blank

If your DECmate II system is running CP/M and you do not type anything at the keyboard for about thirty minutes, your display screen will go blank. This is not a problem. It is a feature of CP/M 2.2, Version 2.0, which prolongs the life of your display screen. Press the SHIFT key once to restore the display.

A

Appendix

Storing, Handling, and Using Diskettes

Diskettes, when used with care, are remarkably durable and reliable storage devices. Any given portion of a diskette surface can be read and written upon millions of times before the oxide film that holds the data begins to wear thin. Moreover, diskettes routinely pass diagnostic tests that fill the tracks of the diskette with data. These data are then checked, changed, and rewritten in worst-case format, over and over again for hours, all without a single error.

But in spite of this ruggedness and potentially perfect behavior, diskettes (or flexible disks, or floppies) have a bad reputation in the data processing community. Why?

Because they are small and easily handled, diskettes are often abused. People use them for coasters or bookmarks, or leave them lying around in the open without their protective envelopes. The surprising thing is how many of them keep working despite the poor treatment.

Do not push your luck. If you want to avoid trouble, strictly obey the following rules:

Storing Diskettes

- Keep diskettes in close-fitting, dust-tight boxes (like those they are packaged in when you buy them ten at a time).
- Store these boxes in rooms whose temperature, humidity, and general cleanliness remain within normal office limits.

Handling Diskettes

- Avoid bending the diskettes. The flexibility of a floppy diskette is an accident of its design, not a goal. It will bend, but, when bent, its covers may crease or warp in ways that cause wear and binding when the drive spins the diskette inside. Forget the word *flexible*. Insert the diskette *gently* into the drive. (If the drive has tight tolerances, you may have to thread the diskette carefully through the slot.)
- Never touch the diskette data surface (that is, the shiny, usually brown or black surface inside the square black cover). Body oils cause the diskette drive Read/Write heads to behave erratically—usually at the cost of lost data.
- Always return diskettes to their protective envelopes—even if you expect to use them again in a few seconds. One piece of grit picked up from a desk top can ruin the diskette.
- We wish we could also recommend that you never lay your diskettes on top of anything. Unfortunately, you have to put them down sometimes. Do not put diskettes down on metal surfaces or on electrical equipment, (including the top of your DECmate II screen or system unit).
- If you must lay your diskettes (in their protective envelopes, of course) on your desk top rather than replacing them in their storage boxes, never lay anything on top of them.
- Keep diskettes far away from those convenient small magnets that are often used to hold notes and pictures to metal surfaces. These handy gadgets are instantly destructive to any magnetic storage medium and are capable of exerting their influence at startling distances.

Using Diskettes

- Always identify your diskettes with the self-sticking labels that most manufacturers provide for that purpose. You can always ask the computer to tell you what is on a diskette, but this slows you down. If you fill out these labels after they are applied to the diskette cover, *never* use a ball-point pen or pencil. They can dangerously crease both the diskette cover and the diskette inside. Use only a felt-tipped pen. They exert the least pressure.
- Never allow diskettes to become so full that you risk running out of space while trying to write data to them. Leave some empty space on your data diskettes. Your time is worth more than the savings on a few hundred bytes of unused space on a five dollar diskette. (Chapter 2 provides information about determining the amount of free space on diskettes and moving files to empty diskettes.)
- When running application programs that write data to diskettes, never exchange one diskette for another, except when the program tells you to do so or the program has finished executing. Some programs open files and leave them open until all the required data has been entered and acted upon. If you exchange diskettes in the middle of such an operation, you will almost certainly have trouble.

Before installing a different diskette in a drive that has just been used for writing data, it is probably a good precaution to restart the system by typing <CTRL/C>. See Chapter 2 for more details. This will insure that CP/M has initialized all of its internal diskette pointers.

- Never turn the power on or off when a diskette is installed in any drive. For the first few milliseconds after either of these operations, the drive electronics are in an indeterminate state in which almost anything can happen—including surges of data-destroying current to the Read/Write heads.

Note that write-protect tabs *do not* protect you from these data-killing surges. They simply prohibit you from writing on the diskette.

A Note on Buying Flexible Diskettes

The DECmate II diskette drives use RX50 single-sided, double density flexible diskettes. These are oxide on 0.003 inch (0.08 mm) Mylar, in a 5.25 inch (133.4 mm) square jacket.

RX50 diskettes are high quality, factory-preformatted, single-sided diskettes. Their design ensures reliability, long wear life, and drive-to-drive interchangeability.

You can order one of the following RX50 diskette packages from Digital Equipment Corporation:

- Part number RX50K-10, for a box of 10 diskettes
- Part number RX50K-50, for a box of 50 diskettes
- Part number RX50K-A0, for 10 boxes of 10 diskettes
- Part number RX50K-AJ, for a bulk package of 100 diskettes

Mail orders should be directed to:

Digital Equipment Corporation
Box CS2008
Nashua, N.H. 03061

To order by phone, call between 8:30 am and 6:00 pm Eastern Standard Time:

- In U.S. (except New Hampshire, Alaska, and Hawaii): 800-258-1710
- In New Hampshire, Alaska, and Hawaii: 603-884-6660

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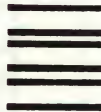
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